HOSPITAL PROGRESS

A JOURNAL OF HOSPITAL SCIENCE AND NURSING EDUCATION

Official Journal of the

CATHOLIC HOSPITAL ASSOCIATION OF THE UNITED STATES AND CANADA

Published With Ecclesiastical Authorization

VOL. XXII MARCH, 1941 No. 3

TABLE OF CONTENTS

The Trial of the American Medical Association

I. Statements by Counsels for the Government and for the Defense 69
Abstracted by *Alphonse M. Schwitalla, S.J.*

A. Opening Statement on Behalf of the United States 69
John H. Lewin

B. Additional Opening Statement on Behalf of the United States 72
Grant W. Kelleher

C. Opening Statement on Behalf of the Defendants 73
William E. Leahy

An Isolation Unit in a General Hospital of Seventy-five Beds 78
Sister Carmen Marie Swift, O.S.F., R.N., B.S.

Specific Nursing Measures Apposite to Blood Transfusions in Infants 86
Roberta Catherine Beal, R.N., B.S.

Our Authors 99

New Books 100

Personal News Items 101

Hospital Activities 18A

New Hospital Products 39A

GENERAL INFORMATION

Entered April 2, 1920, as second Class mail matter in the Post Office at Milwaukee, Wisconsin, under the Act of March 3, 1879, Copyright, 1941, by the Catholic Hospital Association of the United States and Canada.

SUBSCRIPTION INFORMATION

The Active and Associate members of the Catholic Hospital Association receive HOSPITAL PROGRESS as a part of their Association membership. The subscription fee to the journal for all others is $3.00 per year, payable in advance; in Canada $4.00; foreign $4.00. For single copies, the price is forty cents; for copies of the journal more than six months old, fifty cents per copy.

Notice of changes of address should include the complete old and new forms of address. Complaints concerning the nonreceipt of subscribers' copies will be duly honored if made within fifteen days after publication date. Remittances for subscriptions should be made payable to "Catholic Hospital Association."

The Catholic Hospital Association employs no subscription solicitors. Neither has it authorized any agents to accept subscriptions in its behalf.

ADVERTISEMENTS; MANUSCRIPTS

The Association supports the advertising policy of the American Medical Association. The decision of the Council on Pharmacy and Chemistry of the American Medical Association regarding the scientific character of a product and the sales methods of the manufacturer shall be considered final.

The Association reserves the right of exclusive publication of papers delivered before the Association's Annual Convention and before the meetings of the Association's Sectional Conferences in its official journal.

The Editorial Board invites contributions of all kinds bearing on hospital problems and on nursing education. These contributions should be directed to the Editorial Office of the Association's journal.

All articles are protected by copyright which is registered in the name of the Catholic Hospital Association. Permission to re-publish any article in the journal must be obtained from the Editor-in-Chief. Permission for the re-publication of any material published in the Association's journal is subject to two conditions: (1) that it be not used for a commercial purpose; (2) that the re-publication of the matter appear in a reputable journal. Footnotes and bibliographies should conform to the style of the *Quarterly Cumulative Index Medicus* published by the American Medical Association, in which Medical Reference volume the contents of HOSPITAL PROGRESS are indexed. Requirements of this style are the following, in the order listed: name of author, title of article, name of periodical with volume, page, month, and year.

Should the author desire reprints of his article, the order for the same may be directed to the publisher's office. Requests for reprints should be made not later than a week after publication of the article.

The editors of HOSPITAL PROGRESS welcome all news items. Subscribers are requested, accordingly, to forward to the editorial office any items of interest, programs, newspaper clippings, etc.

BOOK-REVIEW POLICY; SPECIAL PUBLICATIONS; COMMUNICATIONS

Books will be reviewed either extensively or by briefer notice. All books to be reviewed will be submitted to the editorial office. The policy concerning book reviews in the Association's official journal has been formulated and is available to all who may be interested.

From time to time the Editorial Board of HOSPITAL PROGRESS authorizes the preparation of special publications. For information respecting such publications consult the Association's central office.

Communications regarding all matters relating to Subscriptions, Manuscripts, Book Reviews, and Special Publications should be directed to the Association's central office. All arrangements for advertising should be made with the publisher's office.

FOREIGN SUBSCRIPTION REPRESENTATIVES

For England—Geo. E. J. Coldwell, Ltd., 17 Red Lion Passage, Holborn, London, W.C. 1, England. *For Ireland*—Browne & Nolan, Ltd., 42 Nassau St., Dublin, Ireland. *For New Zealand*—Catholic Supplies, Inc., 63-68 Dixon St., Wellington, New Zealand. *For India*—B. X. Furtado & Sons, Kalbadevi Road, Bombay, India. *For Australia*—Pellegrini & Co., 543 George St., Sydney, Australia. *For the Philippine Islands*—Catholic Trade School, 1916 Oroquieta, Manila, P. I.

Publication Office

THE BRUCE PUBLISHING COMPANY

540 NORTH MILWAUKEE ST., MILWAUKEE, WIS.

Eastern Advertising Office: 330 W. 42nd St., New York, N. Y.

Central Advertising Office: 66 E. South Water St., Chicago, Ill.

Pacific Advertising Office: 580 Market St., San Francisco, Calif.

Editorial Office of

HOSPITAL PROGRESS

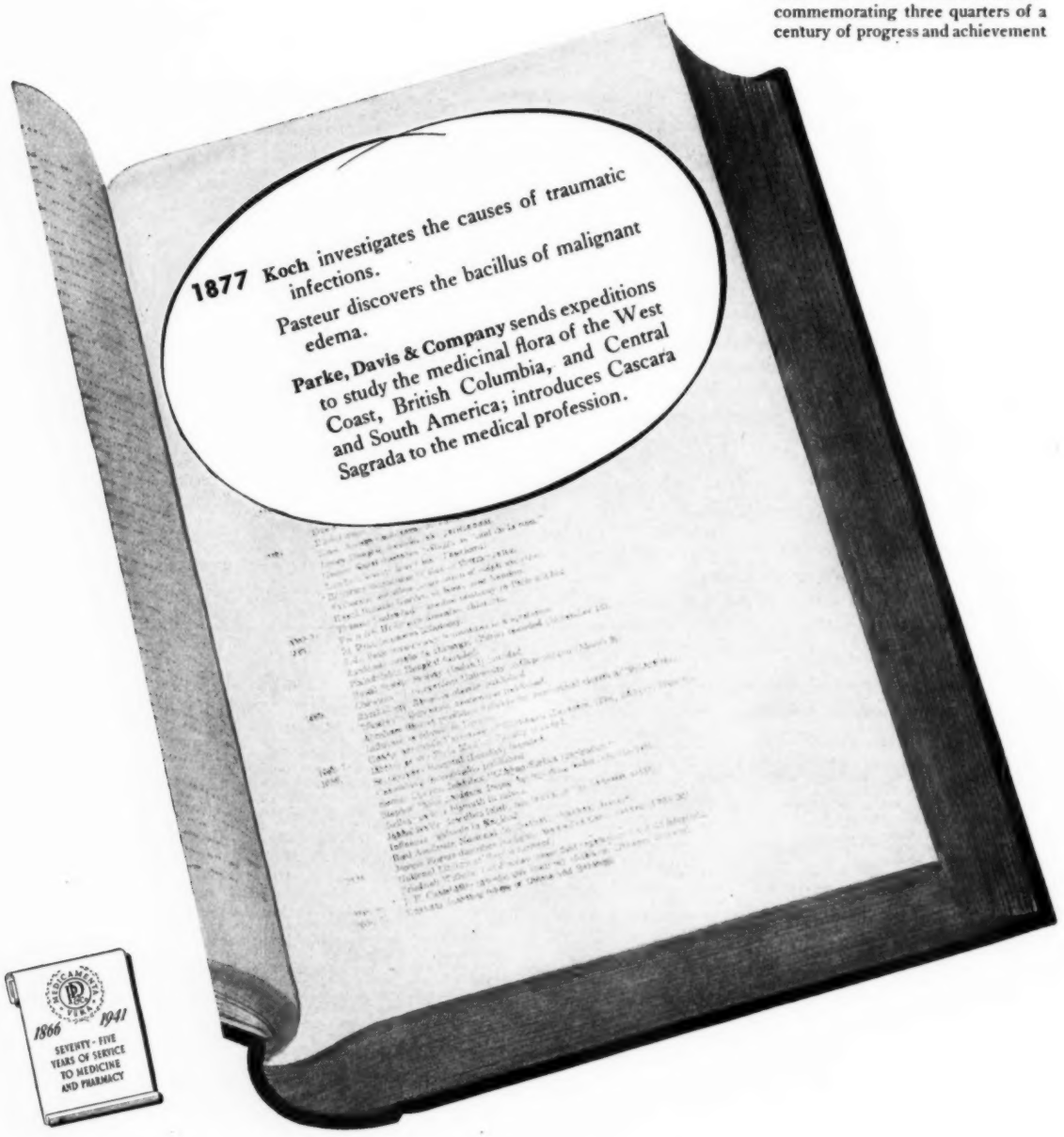
and Central Office of the

CATHOLIC HOSPITAL ASSOCIATION OF U. S. AND CANADA

1402 S. Grand Blvd., St. Louis, Mo.

THESE NAMES, THESE YEARS HAVE HELPED MAKE MODERN MEDICAL HISTORY

One of a series of advertisements commemorating three quarters of a century of progress and achievement


1877 Koch investigates the causes of traumatic infections.
Pasteur discovers the bacillus of malignant edema.
Parke, Davis & Company sends expeditions to study the medicinal flora of the West Coast, British Columbia, and Central and South America; introduces Cascara Sagrada to the medical profession.
1866 1941
SEVENTY-FIVE YEARS OF SERVICE TO MEDICINE AND PHARMACY

PARKE, DAVIS & COMPANY

PIONEERS IN RESEARCH ON MEDICINAL PRODUCTS

HOSPITAL PROGRESS

VOL. XXII MARCH, 1941 No. 3

The Trial of the American Medical Association

I. Statements by Counsels for the Government and for the Defense

Abstracted by Alphonse M. Schwitalla, S.J

THE trial of the American Medical Association to which reference has several times been made in this journal, began on Wednesday morning, February 5, 1941, at ten o'clock before Associate Justice James M. Proctor and a jury in Criminal Division No. 2 of the District Court of the United States in the District of Columbia.

Mr. John F. Lewin, special assistant to the Attorney General, is acting as Counsel for the prosecution assisted by a special assistant to the Attorney General, and four special attorneys from the Department of Justice. The American Medical Association and its codefendants are represented by Mr. William E. Leahy, Mr. Edwin M. Burke, Mr. Seth W. Richardson and other lawyers as Counsel for the defense. The selection of the jury occupied considerable time.

The opening statement on behalf of the United States began on the afternoon of February 6.

A. Opening Statement on Behalf of the United States

by John H. Lewin

Mr. Lewin in his presentation of the indictment summarized the charges brought against the American Medical Association and its codefendants by the Grand Jury of the District of Columbia. His statement is the following:

> "The indictment charges that the defendants committed a misdemeanor by violating Section 3 of the Sherman Anti-Trust Act, that section of the Sherman law which applies to the District of Columbia, in that they first concertedly boycotted and restrained business of a medical cooperative known as Group Health Association, Inc.; that they concertedly restrained the business operation of twelve private Washington hospitals, and that they restrained a number of doctors, those connected with Group Health Association, and doctors who otherwise would have been connected with it or would have consulted them in the free and lawful pursuit of their own calling. It charges that these defendants entered into and participated in a conspiracy to do these things over a period of approximately two years, beginning in January, 1937, running continuously through 1937 and 1938 down to the date of the indictment, which was December 20, 1938."

1. The Principles of Medical Ethics of the American Medical Association

After discussing in broad outlines the nature and organization of the American Medical Association, Mr. Lewin referred to the "Principles of Medical Ethics" of the American Medical Association and showed that through the operation of these principles, the American Medical Association keeps control of its membership "because members are unwilling to suffer loss of prestige and ostracism which would result if they should be expelled from these societies." The American Medical Association is said to possess "enormous power to boycott and thus restrain" the activities of agencies, persons whose business methods differ from those of the American Medical Association. It was pointed out, furthermore, that the victims of the power of the American Medical Association were:

a) The Group Health Association of Washington;

b) The doctors "who claim the right to pursue their callings unhampered" by such restrictions as the American Medical Association imposes, as for example, the members of the medical staff of Group Health Association;

c) The doctors who would have joined the medical staff of Group Health Association if the American Medical Association's restrictions had not been effective; and finally

d) "The twelve private independent so-called Washington hospitals" who, it is said, would have extended their privileges to the physicians employed by Group Health Association, Inc.

2. Group Health Association, Inc.

The Group Health Association, Inc., was designated as a "consumer cooperative"; that is, a cooperative association made up of those persons who desired to obtain their medical services through the Association. It was formed originally for the purpose of

affording health protection on a prepayment basis to the employees of the Home Owners Loan Corporation, the intention being to extend it, as it was extended, to "other executive departments and bureaus of the Government." The Group Health Association was incorporated on February 24, 1937, as a nonprofit organization. The dues were originally $2.20 monthly for individual members and $3.30 for a family membership. Later, however, family membership was raised to $4 monthly and small additional charges were made for dependents. For these dues, Group Health Association undertook to establish a modern up-to-date clinic and to supply 21 days of hospitalization when needed. It undertook, furthermore, to give to its subscribers "complete medical care," to conduct regular physical examinations of its members, and to give preventive treatment. A medical director was employed who was a licensed physician and as many additional staff members were to be appointed and paid as would be necessary for the conduct of the Association's activities.

It was planned that the dues collected would make the program self-sustaining. To initiate the undertaking, "the officials of the Home Owners Loan Corporation entered into a contract with Group Health Association, Inc., in March, 1937, whereby, on the one hand, the H.O.L.C. agreed to make available absolutely to Group Health Association the comparatively small sum of $40,000 and whereby, in return for that Group Health Association undertook in this contract to maintain this medical service for the employees of H.O.L.C." The clinic went into operation on November 1, 1937.

Mr. Lewin then went on to show how Group Health Association, Inc., "was blocked and hampered by these defendants in order to prevent the Association from acquiring a staff." He discussed the need for such associations as the Group Health Association, discussed its mode of operation, and pronounced the whole plan to be sound and reasonable. He stated that the subscribers to the plan could thus purchase medical attention at an expenditure which they could afford to pay and that, therefore, the formation of the new association was designed to enable its members to meet their economic problem. He admitted that membership was not confined to persons in the low-income groups but stated that, nevertheless, by November 1, 1937, no fewer than 83 per cent of the subscribers belonged to the low-income groups.

3. The Medical Society of the District of Columbia

Counsel for the prosecution then went on to detail some of the activities of the Medical Society of the District of Columbia in preventing the medical organization of Group Health Association, Inc. He promised, furthermore, that the evidence would show that the hospitals of Washington were successfully enlisted in the opposition of the Medical Society in combating the Group Health Association. The principal means adopted by the District Medical Society "to carry out their conspiracy to crush and destroy this competitor" were said to be:

> "1. To prevent any of the 800 or more doctors of the District Medical Society in Washington from accepting employment from Group Health Association, even if they wanted to do so, or from even consulting with any other Group Health Association doctors whoever they may be.
>
> "2. To obstruct Group Health in its efforts to obtain doctors for its staff from members of the profession, who were not even members of the District Medical Society.
>
> "3. To attack doctors who joined Group Health Association staff in order to induce them to resign, quit, and abandon Group Health Association or, failing that, to punish them and discredit them in their profession in the hospitals.
>
> "4. To induce all, every one of the local private hospitals which were supposed to be independent enterprises, to join in this boycott of Group Health Association by refusing to admit Group (Health) doctors to hospital privileges in their institutions."

In the evidence which he summarized for the activities of the local Medical Society, a great many details concerning numerous meetings of various groups were presented. Numerous letters were interchanged, conferences were held, and representations were made to a large number of persons. Later, it was said, the local Medical Society was "assisted by the Chicago representatives of the powerful American Medical Association . . . who were specifically authorized to come down here to Washington to be on the ground, to participate and cooperate with the local defendants."

A. Committee Study of the Problem

Again, several committees undertook the study of the problem. Mr. Lewin expressed the opinion that the "conspiracy" was thus intensified in its intent and procedures and that in the interchange of opinions harsher words and harsher procedures became progressively more frequent. Evidence was reviewed to show that certain physicians wanted to join the staff of Group Health Association, Inc., but were deterred from doing so by fear of the possible actions of the Medical Society; that controversies arose concerning consultations of members of the Medical Society with members of Group Health Association, Inc.; that the local medical society through its disciplinary committee proceeded against the physician who had accepted the medical leadership of the new association; that persons in the employ of Group Health Association, Inc., who took sick became the innocent victims of the disagreements among the doctors, the patient being permitted "to remain a long time without attention, with her life in serious danger . . . while he (the physician) haggled with the Group Health doctor as to whether he would be permitted by the Society to take the case." It was stated by Mr. Lewin that the Association's choice of its first medical director, "who had just had a fine career in the Medical Corps of the United States Army" was prevented from being

effective for fear of the disapproval of the District Medical Society.

Up to this point, Mr. Lewin summarizes his statement as follows: "I told you that the defendants, as a powerful group, determined to destroy Group Health Association because they realized it was a business competitor of theirs, and they determined to destroy it by boycott; and then I told you of the principal means they adopted to shut them off from gaining a medical staff from any members of these large societies, and shut them off from getting a medical staff from even outside these societies by intimidating such members."

B. Alleged Attacks on Medical Staff Members of Group Health

"Now, let us take up the third of these means. The first was the staff boycott. The third means were attacks by the defendants on Group Health Association doctors, in order to induce them to resign from Group Health Association, or if they did not do so, to discredit them."

He promised evidence "that attacks were made on each of the Group Health Association doctors, as I have named them, with the exception of this Dr. Brown. The attacks succeeded in the case of three of these doctors: Dr. Lee, Dr. Hulbert, and Dr. Richardson, internists, who were induced by pressure, exerted by the District Medical Society, to abandon Group Health, and Group Health Association thereby lost their services completely." He also promised evidence to show that two of the Group Health doctors "refused to be intimidated . . . and as a result, disciplinary action was brought against Dr. Scandiffio here, and against Dr. Selders away down at the end of this long arm of the defendant corporation, the American Medical Association in Texas, in an effort to punish them." The former was expelled from the District Medical Society and hence, from the American Medical Association. Against Dr. Selders, proceedings were instituted in Texas.

C. Restraint on Hospitals by the American Medical Association

With reference to the next chapter in the history of this controversy, Mr. Lewin says as follows: "It is charged that the defendants conspired and coerced, or conspired to coerce these hospitals to boycott Group Health Association doctors from practicing medicine. Then, the defendants are charged with placing unlawful restraint on hospitals in the conduct of their own hospital businesses, and with employing these restraints on the hospitals as a further means for restraining and destroying the defendants' competitor, Group Health Association." Twelve private hospitals in Washington were said to be available to Group Health Association patients. Each of these hospitals has a regular or a courtesy staff who may bring patients to the hospital. Members of Group Health Association asked to be admitted to the courtesy staff but the hospitals are said to have "failed to grant these applications not to just one doctor of Group Health but to all doctors of Group Health; and such doctors of Group Health were excluded therefrom (from the hospitals)." It was stated by Mr. Lewin that this exclusion of the Group Health Association physicians was due to the "pressure on each one of these hospitals to cause them to exclude Group Health doctors."

In explaining the procedures by which the local Medical Society influenced the hospitals, he said "the evidence will show that they (Dr. Fishbein, Dr. West, Dr. Woodward, of the American Medical Association) were formally authorized to bring the Group Health Association's activities to the attention of the medical profession; and that acting under such authority, they caused to be published in the American Medical Association Journal of October 2, 1937, an article attacking Group Health in highly critical terms; and that article was written by the defendant Woodward of the American Medical Association and was disseminated among these 95,000 members of the organization throughout the country." In the course of the article referred to, the following passage occurs "It is not clear how they (the medical staff members of Group Health Association, Inc.) are to obtain qualified consultants or procure hospital services for their patients. In any event, medical care in the associations would be likely to be handicapped by difficulties likely to be experienced in obtaining the best consultants' services and hospital facilities . . . (since those physicians who had sold their services to Group Health Association for re-sale) . . . are certain to lose professional status."

The local Medical Society was said to contain a prohibition forbidding its 825 members from serving on staffs of nonapproved hospitals. The District Medical Society, therefore, was said to possess the power to "un-staff any hospital" by simply withdrawing approval from the hospital. Mr. Lewin stated that the District Medical Society quickly adopted and put into effect "the suggestion that emanated from the parent body of the *A.M.A.* in Chicago" and sent a copy of the Association's policy to each of the members of the local society. The District of Columbia Medical Society was said to be in complete accord with the attitude of the *A.M.A.*

D. Further Restraint Alleged

Mr. Lewin then reviewed the many conferences and meetings both of the District Medical Society and of hospital groups which led up to the action just mentioned. He also presented his evidence to show that the District Medical Society through its committees had discussed methods by which it could make effective through its influence on the Washington hospitals, the attitudes which it (the Society) had formulated toward Group Health Association, Inc. He summarized his statement up to this point by saying that "the evidence will show you how completely succumbing these hospitals were to any such pressure

from the Medical Society . . . that these boycotts inaugurated and fostered by the combination and conspiracy charged in this indictment were completely successful."

The actions of the Washington hospitals with reference to Dr. Selders were also reviewed and Mr. Lewin stated that these actions were aimed "not against Dr. Selders as such, but against the Group Health Association and any Group Health doctors who should request the privileges of treating Group Health patients in the hospital."

Finally, Mr. Lewin pressed his next charge in the following words: "We will also in this evidence show examples of harsh, outrageous, impossible, and unreasonable treatment accorded to the members of Group Health Association by a number of these hospitals. Some of the patients taken to the Washington hospitals following automobile accidents or for serious operations, were turned away when they or their relatives insisted upon treatment by the Group Health Association doctors of their own choice."

Toward the conclusion of his statement, Mr. Lewin discussed briefly the part which the Washington Academy of Surgeons took in the alleged conspiracy.

B. Additional Opening Statement on Behalf of the United States

by Grant W. Kelleher

Mr. Grant W. Kelleher, counsel for the prosecution, began his statement by pointing out that "it is this conspiracy here in the District of Columbia and only this, for which the defendants are on trial. But while the alleged conspiracy for the District of Columbia has been for something less than two years, it had the country as a whole for its background, and for a prologue it goes back several years before the commencement of the alleged conspiracy."

1. More Adequate Distribution of Medical Care

Mr. Kelleher then discussed the need of such organizations as Group Health Association in order that a pressing national social problem, namely, the adequate distribution of medical care, may be solved. He alleged that the defendants, especially the *A.M.A.*, had been interested in stifling competition, economic competition, with the physicians belonging to organized medicine which would surely result if organizations such as Group Health Association were permitted unhindered and unhampered development.

He promised that Dr. Hugh Cabot and Dr. Michael Davis in their expert testimony would present the background of the alleged conspiracy showing the need for group practice so that the cost of medical care might be reduced and the need for prepayment plans so that the cost of medical care might be spread in time. Mr. Kelleher believed "that there are many well informed men and women today who believe in good faith and after careful study that the distribution of medical care has failed to keep pace with the problems presented by the technical advancement . . . and that as a result, there is a large body of American people who do not receive adequate medical care or are oppressed by the heavy financial burden of the care which it does receive."

Two reasons are assigned for this situation: First, the progress which medicine has made has substantially increased the cost of medical care; and secondly, illness "is as unpredictable as lightning" and often strikes more than once in the same place. As authority for this analysis of the alleged reasons, Mr. Kelleher offered the studies of the Committee on the Cost of Medical Care. He summarized some of the findings of the Committee and then pointed out as one of the Committee's conclusions which is specially relevant to the present trial; namely, the recommendation made in the Majority Report of the Committee "persons with small incomes should organize into groups for the purpose of obtaining medical care on a prepayment basis from organized groups of medical practitioners." Mr. Kelleher admitted that a small minority of nine members "vigorously opposed this recommendation and took the position that prepayment plans are undesirable." The *A.M.A.* endorsed the views of the minority through the action of its House of Delegates. The American College of Surgeons, on the other hand, recommended that experiments with periodic prepayment plans should be undertaken or continued. This opinion of the American College of Surgeons was, however, condemned by the *A.M.A.* shortly after it was made.

2. Fundamental Principles Formulated by the American Medical Association to Govern Experiments in Medical Care for Persons of Moderate Means

The *A.M.A.*, as Mr. Kelleher stated, formulated in 1934 a set of "so-called fundamental principles to govern experiments to provide more adequate care to people with moderate means." One of these principles required that any plan should "embrace within it all of the qualified physicians within the locality to be served by the plan." Another required "that the cost of medical service in any plan must be borne by the patient who could afford to pay at the time the service was rendered." Mr. Kelleher concluded that the principles "served to illustrate the hostile policy of the *A.M.A.* of group practice on the prepayment basis."

3. The Policy of the American Medical Association Re Group Practice

Mr. Kelleher admitted that the attitude of the *A.M.A.* would of itself not be reprehensible provided the Association had confined itself "to peaceful per-

suasion in seeking to obtain adherence to its policy." As a matter of fact, the *A.M.A.* was said to have adopted quite a contrary attitude bringing to bear "its tremendous powers to force doctors and hospitals throughout the United States to abide by this requirement." The *A.M.A.* as a matter of fact can exclude or expel a doctor, so it was said, and thus deny him essential consultation with his fellows. Through its system of approval and registration of hospitals, it can obtain the ouster of a physician from the staff of any approved or registered hospitals. These powers, it was stated, have been used in more than one place and instances were offered to show the effectiveness of the procedures.

4. Reasons for the Opposition of the American Medical Association to Group Health Association, Inc.

Mr. Kelleher then went on to promise evidence showing the validity of the reasons why the defendants opposed the Group Health Association; the reasons being "first, its setup would necessarily result in a reduction of the quality of medical service below that of the private medical practitioner; and second, because Group Health Association was illegal."

Concerning the first reason, Mr. Kelleher undertook to present evidence "that the quality of medical care which Group Health Association gives to its members is at the very least the equivalent of the care which the average medical practitioner in the District of Columbia gives to his patients."

Concerning the second reason, Mr. Kelleher pointed out that the illegality of Group Health Association was either based on the principle that as an organization it was engaged in the practice of medicine without a license or that it was in the insurance business without having complied with the insurance laws of the District of Columbia.

The counsel for the prosecution then analyzes these reasons in detail indicating that these reasons were inadequate to account for the attitudes adopted by the defendants with reference to Group Health Association. Rather, he pointed out, that the real reason for opposition by organized medicine to Group Health Association was the "economic self-interest" of the physician. His concluding sentence is "that evidence which I have just summarized, will show the keystone of the conspiracy, the economic purpose of the defendants to destroy legitimate competition in the practice of medicine in the District of Columbia."

C. Opening Statement on Behalf of the Defendants

by William E. Leahy

1. The History and Organization of the American Medical Association

Mr. Leahy reviewed the early history of the Medical Society of the District of Columbia pointing out that it had received its charter from the Congress of the United States in 1819. Eleven medical associations had been formed previously, New Jersey having had its medical association as early as 1766 and Massachusetts as early as 1781. Maryland formed its medical society in 1799. Those early medical associations particularly the one in the District of Columbia, expressly avowed that the medical society has no right to control prices for the services which its members give to those who are sick. Since those days, an ethical principle to which doctors subscribe is this "that open competition is the life of the medical profession just as it is the most desirable element for the patient."

Mr. Leahy then went on to review the early history of the *A.M.A.* formed in 1847 patterned on our form of government: the Association being made up of state societies and these in turn being made up of constituent members; namely, the county societies. Each county association is recognized as an absolutely independent unit exercising no control over the reasons for the membership or with the administration of the county society's affairs. The county medical societies are voluntary associations which a physician joins without coercion or compulsion, the physician's free will and voluntary choice alone determining his application to become a member.

In accordance with its structure, the Association is governed by those who represent the component state organizations and the constituent county societies. These representatives constitute the *A.M.A.'s* House of Delegates. With reference to the ethics of the *A.M.A.*, counsel for the defendants pointed out that these are not autocratically set standards and that physicians who choose not to conform to these standards are necessarily victims of the Association's coercive powers. There are fully 60,000 doctors not members of the *A.M.A.* against whom the *A.M.A.* has never moved.

Of the 2000 doctors in the District of Columbia, only 825 belong to the District of Columbia Medical Society. Fully 1200 doctors in the District, therefore, are not members.

The principles of ethics, therefore, are not intended as coercive or restrictive regulations. Their present formulation is based, so Mr. Leahy stated, upon a formulation made in 1803 by an English physician of Manchester, England, Thomas Percival and that formulation in turn was based upon the old Oath of Hippocrates.

2. The "New" Concept of Medical Care

Mr. Leahy reverted to the opening statement of Mr. Lewin. He called attention to the introduction of

such concepts as a "consumer cooperative" when referring to Group Health Association as well as to the practice of medicine which was "described as the 'distribution of medical care.' " "They (these concepts) are new ideologies but these new ideologies came into clash with the ordinary method under which you and I were born and lived, and they thought in order to cure this country of the social evils of which this country was suffering and the world itself was suffering, they ought to destroy the old order entirely and start all over again." Mr. Leahy expressed the opinion that the objective of Group Health Association was "to impose upon the medical profession of the District of Columbia this social economic experiment."

Mr. Leahy does not believe that the formation of Group Health Association was the spontaneous outburst of the employees of the Home Owners Loan Corporation. Rather he regards it as "one of the most carefully conceived schemes which has ever been put into operation." It arose "under the advice, counsel, inspiration, and instruction of . . . a 'foundation' or a 'fund.' "

Mr. Leahy admitted the enormous development which has taken place in medicine and in medical practice but insisted that this development was due in a large measure to the *A.M.A.* and to the efforts which it made "to prevent the destruction of that progress by the quack and the charlatan who advertised his wares in such language as Group Health Association advertises to catch the public with a phrase 'You can budget your sickness expenses. You can pay so much a month and get adequate medical care.' " So much has the *A.M.A.* done for the advancement of medicine that whereas formerly physicians went to Europe for their advanced education in medicine, Europeans are coming to us today.

3. The Activities of a Number of Funds and Foundations in the Field of Medical Care

The history of a number of Funds and Foundations was next reviewed. The Cooperative League of Boston established in 1919 became the Twentieth Century Fund in 1922. Mr. John H. Fahey, who is chairman of the Board of the Home Owners Loan Corporation, was also a close personal friend of Mr. Edward A. Filene, who founded the Cooperative League, and in 1937, became the executor of Mr. Filene's will. If, as the prosecution points out, the *A.M.A.* has power behind it; namely, the power of the constituent and component societies, Group Health Association has behind it the power, especially the financial backing, of the Twentieth Century Fund. In 1936 the Twentieth Century Fund undertook an investigation into and recommendation for the practice of medicine in the United States. The Fund reorganized the then existing Health Economics Association and another corporation which was called the Good Will Fund. "Health Economics Association, Inc., and the Good Will Fund are godfather and godmother to Group Health Association, Inc."

The justification for this statement was said to be the activity of Mr. Penniman; the latter at the time was director of personnel of the Home Owners Loan Corporation. In that capacity, he presented to the board of his Corporation, a report on the cost of sick leaves of the employees, the statement being made at times allegedly that this cost was $100,000 a year, at other times, that it was $500,000 a year. He sought the approval of the Board for some kind of an organization by which medical care could be guaranteed through periodical prepayments. He was also interested in the development of an emergency treatment department for the employees. An organization like the Group Health Association could readily take care of both of these projects.

In undertaking the organization, Mr. Leahy suggested that someone should have been called into consultation "who knows something about how to provide adequate medical care." As a matter of fact, when Group Health Association started in 1936, it never had a word of consultation, advice, or instruction from a single medical doctor in the District of Columbia. It was alleged that those in charge of Group Health Association were economic theorists who were interested in selling medical service "as you sell baked beans or a package of cigarettes over a counter." The elements of personal and confidential service are thus lost sight of. After about two months, a brochure was published for confidential information and dissemination. Such was the beginning of Group Health Association. As yet, no physician had been consulted in its organization.

4. The Promotion and Organization of Group Health Association Without Medical Consultation and Direction

Later, one of the lay organizing members called in a Chicago physician who was known to be an advertiser in the newspapers and who directed an organization later declared as illegal by the Supreme Court of Illinois. The organizers of Group Health Association, Inc., as a matter of fact, later contacted an army officer to secure his services as a medical director but the Medical Association had nothing to do with the refusal of this physician nor of those who were asked subsequently, to become medical director of the new organization.

Later on, a second advertising brochure was published and was widely distributed. It was announced that not only employees of the Home Owners Loan Corporation but of all the Government departments of the District of Columbia were to be grouped together under this plan. This scheme had, therefore, developed to this point "unknown to the Medical Society." As a matter of fact, the Medical Society would not have been concerned with it except for one statement which in substance said "After the plan is ready to launch

then let us try to get the cooperation of the District Medical Society." Correspondence then ensued; conferences and meetings were held. A resolution of the District Medical Association which was allegedly pointed against Group Health Association, Inc., was shown to have been passed before the Medical Society was aware of the organization of Group Health Association. The negotiations between the Medical Society and Group Health Association did not progress satisfactorily.

Mr. Leahy then explained the operation of the *A.M.A.* and its relationship to the county societies. In 1935, prior, therefore, to the alleged conspiracy against the Group Health Association, the House of Delegates of the *A.M.A.* passed a resolution stating that it was in the public interest that members of the staffs of hospitals throughout the country should be members of the *A.M.A.* In the form in which it was adopted, the resolution was to be made a subject of advice and consideration of the Council on Medical Education and Hospitals of the American Medical Association. The organizing members of Group Health Association met with the Executive Committee of the District Medical Society for the purpose of determining the kind of cooperation between Group Health Association and the District Medical Society which was hinted at in the advertising brochure. An inquiry was made into the mode of operation of Group Health Association, into the sources from which the money was to be derived, into the employment policies, and into similar questions. Information as to the sources of funds was apparently denied to the representatives of the Medical Society.

Just about this time, another difficulty arose with reference to the so-called "white list of approved plans." It was alleged by the officials of Group Health Association that the "white list" was aimed at their own organization. As a matter of fact, it was aimed at a previously existing clinic. At one of the conferences between the representatives of the two organizations, the Medical Association asked to see the contract of the Association with the employed physicians. This was thought all the more reasonable since in Washington there were at the time, eight or ten groups which were deemed as practicing medicine in accordance with the ethics of the District Society and not one of them was disapproved. Since inspection of the contract was refused, the Group Health Association's name was not placed upon it; the list however, was available early in July whereas, Group Health Association did not open until November.

Again in the past history occurred an incident concerning the election of a medical director who although he was selected as a possible candidate for the position was not given details concerning all the contracts and the financial arrangements of the Association. The question was also raised why in view of the fact that there are 69,000 doctors in the United States who are not members of a medical society and in further view of the fact that more than 1,000 of these are in the District, the medical staff of the new Group could not have been recruited from this list of non-members.

5. The Financing of Group Health Association, Inc.

Another aspect of the problem pertains to the initial financing of the plan. Out of Mr. Penniman's recommendation to the Board of the Home Owners Loan Corporation came an appropriation of $40,000. This as a matter of fact, seems to have been voted as a $20,000 a year grant for two years but the entire amount seems to have been paid to the Group Health Association within six months in order that the clinic might be equipped. The relationships with the Home Owners Loan Corporation were even more extended. Mr. John H. Fahey, who was an officer in the Health Economics Foundation and in the Twentieth Century Fund, was still chairman of the Board of the Home Owners Loan Corporation. The facilities of the Corporation were used for the purchase of equipment at government prices. The lawyers of the Home Owners Loan Corporation were used in the formulation and supervision of the structure and conduct of Group Health Association. Certain government officials in high positions were on the board of the Twentieth Century Fund.

From all of this Mr. Leahy concluded that it was for his hearers to judge "whether this was a government attempt to destroy the Medical Society of the District of Columbia and the practice of medicine as it had been known for over a hundred years" or not. At any rate, some government officials expressed themselves as holding the opinion that the use of the $40,000 was a misappropriation and, therefore, was illegal and contrary to the laws of the United States. The relationships with the Twentieth Century Foundation are implied in the statements contained in the 1936 annual report. From this, Mr. Leahy quoted "In substance, we cannot establish this group practice in many of the states because it is forbidden by law, and, therefore, we have applied to the Legislative Bureau of Columbia University to find how we can get around the law." As a matter of fact, Group Health Association submitted to the Board of the Home Owners Loan Corporation a series of amendments "to improve the legal position of the Association."

6. The Investigation of the Legality of Group Health Association, Inc., by the District Medical Society

The District Medical Society found it necessary to employ counsel to determine whether Group Health Association was legally doing business or not. Group Health Association was under the investigation of the Corporation Counsel of the District of Columbia and

of the United States Attorney of the District of Columbia. The District Medical Association did this to determine whether they could cooperate with Group Health Association as a legal institution. They also sought the advice of some of the officials of the American Medical Association. They were advised by their legal consultors "that the Group Health Association was practicing medicine in violation of the healing and practice act of the District of Columbia" and that Group Health Association "was conducting an insurance plan without having obtained a license from the Insurance Commissioner of the District of Columbia." When these opinions were presented to the Corporation Counsel of the District and to the United States Attorney, Group Health was notified by the United States Attorney that it was violating the law and by the Insurance Commissioner that the new Association should take out a license as an insurance company. Subsequent to all of this, Group Health undertook the formulation of new amendments, amending their charter and their by-laws. It was these amended articles on which Justice Bailey passed when he declared that Group Health Association was legally in business.

Within four days, Mr. Thurman Arnold announced his intention to indict the District Medical Society. Even now, the Court of Appeals to which the Corporation Counsel took the question of the practice of insurance by Group Health Association pronounced it an open question in the District of Columbia. Circumstances would seem to point to a determination on the part of Group Health that they were going forward with the experiment against all opposition.

7. Comments on Certain Sections of the Opening Statement for the Government

Mr. Leahy went on to say that in the statement on behalf of the Government, three plans of attack on Group Health Association were organized by its opponents: First, to prevent the formation of a medical staff for the new association; secondly, to prevent physicians consulting with the medical staff of the new association; and thirdly, to prevent the hospitalization of patients of Group Health Association. Mr. Leahy insisted that the District Medical Society "never objected to a patient of Group Health being treated in any hospital in the District of Columbia at any time for any disease or any purpose." He also stated "the hospital objected only under certain circumstances" and "Group Health insisted not that the patient be entered in the hospital but that its doctor also treat that patient in the hospital."

Mr. Leahy then answered the statements in the opening statement by the counsel for the Government with reference to the admission to the hospitals of Washington of some of the patients of Group Health Association. In this connection, he attempted to show that the real character of the problem involved in the acceptance of patients by the hospitals was the assumed rights of certain nonstaff members to practice in the hospital and to participate in the medical resources of the institution. Again, it was thought by Mr. Leahy that through these cases, efforts were being made to create evidence against the District Medical Association.

Again, a series of meetings were held with reference to the eligibility for admission to the courtesy staffs of some of the physicians of Group Health Association. At one place in his remarks, we find the following passage by which Mr. Leahy illustrates the attitude of Group Health with reference to this problem: "In other words, Group Health could employ whomsoever it wanted in violation of the rules of any organization and if the organization said you have your choice: you can still be a member of the medical society but you cannot be on Group Health staff too, he (the doctor in question) said 'I will be both.'"

In the same context, Mr. Leahy says "they have told you in one breath that this Group Health Association was an experiment which would give adequate medical care at a cheaper price. Now don't forget the only thing involved in this case is price, price, price. These men are engaged in an economic experiment. If they would only leave the practice of medicine alone, there would not be any difficulty, but in the assumption of the right not merely to make an economic experiment, but also the right to control medicine, they have clashed with an organization which over the centuries, has learnt how medicine ought to be practiced in the public interest, and it is the only group on earth who can determine that." Mr. Leahy argues that if Group Health Association was equipped to render medical service, why did it need to consult with the District Medical Society; they could have selected their staff from the 1200 nonmembers in the District. Why then aim at the Medical Society unless it be merely that more evidence must be created. "The fact of the matter is that they were out to destroy the District Medical Society by this new experiment."

8. The Benefits of Membership in Group Health Association, Inc.

The problems concerning the character of the benefits for the members of Group Health were next touched upon chiefly with reference to eligibility for admission to the Group Health Association on physical and on economic grounds. From the pronouncements of some of its officials in various conferences, it seemed clear that Group Health was aware of the limits of its professional resources in the treatment of certain patients. Moreover, it apparently was not intended as a plan for persons in the low-income brackets since "some of their high officials belong to Group Health." As a matter of fact, if a subscriber does not pay his fees within ten days after they are due, he is out; that is, within ten days after the first of the month. When you are most in need, therefore,

of medical care, you cannot get it. It was also admitted by some of the officials that persons who drop out of Group Health Association for nonpayments of dues will have to seek the services of a non-Group Health physician. As for the type of service which is rendered, it was soon found that the needed services could not be paid for at the fees which were first proposed. Apparently the service was first cut down and then the price was raised.

9. Comments on Other Organization Problems of Group Health Association, Inc.

It was pointed out also that one of the medical directors had resigned because "his efforts as a director were being thwarted and hindered by the board of trustees." The board is unquestionably a lay board. A third party should not intervene between the patient and the physician. The confidence between the patient and the physician must remain inviolable. In all of these respects, the arrangements made in the Group Health Association were deemed contrary to sound medical ethics.

In this same connection, it should be pointed out that Group Health operated for a time on subsidized funds and that also for a time, persons who were active in the formation and development and subsequent administration of Group Health Association were paid by one of the Funds to which reference has already been made.

With reference to the hospitals, Mr. Leahy says that the only instance in which the hospitals have been approached at all was by a letter of July 29, 1937, "that was the letter in which the 'white list,' so-called, was sent to the hospitals and not a member of the District Medical Society ever knew that list went to the hospitals because there was no authorization to send it to the hospitals; the authorization was merely to send it to the members of the Association itself."

Moreover, the resolution pertaining to staff membership was frankly a resolution designed for other purposes than chiefly for the restriction of staff membership. On the copy of the resolution, it was expressly stated "For educational purposes alone, we brought your attention to the recommendation that the members of the staffs of hospitals be members of the American Medical Association." As a matter of fact, Dr. Cutter, when the resolution concerning staff membership was written, could not have been aware of its bearing on Group Health Association. The resolution grew out of one of the ordinary routine investigations made by the Council on Medical Education and Hospitals. The resolution was sent to the Washington hospitals as it was sent to the other hospitals of the country and the sending of that resolution to the Washington hospitals can, therefore, not be construed as "an act of conspiracy, a pressure, a tyranny, and a destruction."

Moreover, since Justice Bailey's decision concerning the Group Health Association of 1938 — an entirely different institution than that of 1937 — eight Washington hospitals have members of Group Health upon their staffs. In other words, after Group Health Association was declared a legal institution, the Medical Association acting in good faith has modified its attitudes to meet the new situation.

(To be continued)

LUNCHEON MEETING OF CHAPLAINS, ILLINOIS CONFERENCE, CATHOLIC HOSPITAL ASSOCIATION, PALMER HOUSE, CHICAGO, ILLINOIS, FEBRUARY 20, 1941.

An Isolation Unit in a General Hospital of Seventy-five Beds

Sister Carmen Marie Swift, O.S.F., R.N., B.S.

Statement of the Problem

GENERAL hospitals are at one time or another confronted with the problem of caring for patients who are suffering from a communicable disease. This is especially true in a town which has no isolation hospital. Since a hospital is a place which provides care for the sick of the community and enables physicians and nurses to serve the sick more effectively, it is obvious that this type of patient should not be denied the privilege of hospitalization.

The purpose of this study, therefore, is to delineate a plan for establishing an isolation unit in a general hospital where contagious-disease patients can receive the full benefit of constant medical supervision, expert nursing, access to the facilities of the laboratory, prompt attention in case of complications; and whereby the afflicted family may be spared the danger of exposure and the inconveniences and perhaps serious financial loss due to quarantine, through the impossibility of establishing an isolation unit in the home.

I. General Consideration of Communicable Diseases

A certain amount of general knowledge must be acquired before a nurse is competent to undertake the care of communicable diseases. It is necessary, for instance, for her to know something of the history underlying our present knowledge of contagious diseases, by what channels causative organisms leave their hosts, how they enter the bodies of their new victims, the length of their periods of incubation and susceptibility, also the dangers of carriers.

Formerly it was thought that disease germs lived outside of the bodies of men. It is only in comparatively recent years that we have come to understand how disease germs are transferred from one organism to another. Epidemics were thought to have been caused by some unusual configurations of the stars, by earthquakes, or by peculiarities of the weather. During the last quarter of the nineteenth century it was commonly believed that diseases were caused by air and sewer gas. About forty years ago, it became a widespread notion that filth of any kind was the most important cause of illness. The early efforts of public health officers were directed toward cleaning up the environment. Much good was accomplished by this work, for, at that time, people lived in a much less cleanly manner than they do now. A marked reduction in cases of typhoid fever and other intestinal diseases followed wherever general sanitary conditions were improved.

But mere municipal housecleaning did not prevent the spread of certain types of communicable diseases whose germs do not live in filth. The important fact brought about by modern studies is that not a single one of the germs which cause communicable disease has any natural existence outside of the bodies of men or other animals. On the contrary, nearly all disease germs die quickly when isolated from their host.

II. Bacterial Communicable Diseases

It is important to note that all diseases in this class are caused by bacteria, microorganisms which are ubiquitous. Particles of dust are laden with them. They are present in the mouth, stomach, and intestines of animals and human beings, on the surface of the skin, under the fingernails, and on the hair. They are in water and on land, and especially abound in all forms of decaying matter. Everywhere in nature there exists this limitless army with its wondrous power of multiplication. However, the disease-producing species are relatively few — the majority of bacteria work for rather than against mankind.

The mere contact of pathogenic microorganism with the bodies of men or animals does not necessarily produce disease. When, however, they pass the protective skin and invade the deeper tissues and multiply there, they may form disease-producing toxins.

Infections usually result from contact with contaminated material outside the body.

Organisms that cannot grow apart from the human body must, in order to produce disease, be transferred from one person to another by direct contact. Diseases so transferred are said to be contagious.

Other organisms not so strictly parasitic may gain access to another individual by means of contaminated material. A disease thus produced is spoken of as infectious.

Both types are grouped under the general heading of communicable diseases.

III. Filtrable Viruses

In addition to those organisms which may be readily studied by means of the microscope, there exists another group so small that its "organisms" cannot be demonstrated by ordinary microscopic methods, nor grown in laboratory media. They possess two peculiarities: they will pass through the pores of a fine Berkfeld filter, and many of them "form within the nucleus or cytoplasm of the affected tissues, substances known as inclusion bodies."[1] Plants and animals suffer from

[1]Smeeton, M. A., *Bacteriology for Nurses*, p. 277.

diseases caused by these organisms, which are known as filtrable viruses. "In man, they are thought to be the causal agents in infantile paralysis, epidemic encephalitis, rabies, smallpox, chickenpox, measles, mumps, yellow and dengue fever."[2] They may also cause common colds, warts, shingles, and cold sores.

These viruses show varying degrees of resistance; in general, they are more resistant to heat, chemicals, and drying than are vegetative forms of bacteria. As a rule, immunity following a virus disease is of longer duration than that following other bacterial types, as a second attack of a specific disease is rare.

Apart from these characteristics, these viruses apparently bear no very close relationship to each other. Each has its own peculiar properties and characteristics which produce a characteristic disease. Too, their modes of transmission are not the same. It is impossible to classify them definitely until more is known of their nature. Various theories are held about them, one being that they are very minute and primitive forms of life; another that they are nonliving and of the nature of enzymes. From our present knowledge, there is little which can be said with certainty about their nature.

IV. Modes of Transmission of Communicable Diseases

Bacteria must be carried if they are to cause disease, and there are actually but four classes of carriers. The real source of communicable disease lies in the secretions and excretions of the persons or animals harboring the germs. Feces, sputum, urine, nasal discharges or saliva contain the organisms and are the truly dangerous agents.

The first of the carriers is filth. By this are actually spread the diseases of the gastro-intestinal tract, such as typhoid fever, Asiatic cholera, dysentery, infantile diarrhea, and food infections. The germs are discharged in the excrement from the bowel and get into the system of another person by being taken into the mouth or on dirty hands. Prevention lies in safeguarding food and water supplies from contaminated organisms eliminated in the excreta of acutely ill or convalescent patients. "Fingers, food, and flies" act as the connecting links between the dejecta of the old victims and the mouth of the new.

The second of the carriers is discharges. Secretions from the nose and mouth and discharges from the ears or from running sores are the carriers of the organisms of the communicable diseases of the upper respiratory tract, such as tuberculosis, diphtheria, scarlet fever, measles, mumps, etc. Saliva is the most common medium of exchange. Sneezing, coughing, or loud talking can spread small droplets over a large area. This means of transmission is spoken of as droplet infection. Promiscuous kissing and the use of salvia for various purposes such as stamp licking, etc., can hardly be defended. Prevention of the spread of disease lies in the prompt disinfection of discharges and in the avoidance of the close association that might lead to droplet infection.

The third of the carriers is contact. The diseases spread by contact are usually those of the skin and eyes: pink eye, trachoma, ringworm, the wound infections, and venereal diseases. The manner in which these contacts are made is by kissing, sexual contacts, drinking cups, etc., through the broken or unbroken skin. Control lies in the isolation of the patient, and in the disinfection of the body discharges and all articles which have come into contact with the patient.

The fourth of the carriers is the bite of insects. There are several diseases that are spread by the bite of insects. The more common of these pests are mosquitoes, lice, fleas, and ticks. Plague, yellow fever, malaria, dengue fever, and Rocky Mountain fever are caused in this way. Control lies in the protection of the individual and the extermination of the insect host.

V. Courses of Communicable Disease

Acute infectious diseases usually pass through the following steps: incubation, which begins at the time of infection and continues until the first symptoms appear; the appearance of symptoms; the period of fever, when the disease is at its height. Specific symptoms appear according to the organ involved. During the period of convalescence, the last step, the body gradually returns to its state of health.

VI. Methods of Control

Since, in setting up the planned isolation, the hospital in question is going to be subject to the laws of the State of Iowa, it appears necessary to include in this consideration a chart, taken from the Rules and Regulations of the Iowa State Board of Health, giving vital information for the proper and lawful method of handling the more common communicable diseases. This chart is represented as Table 1.

The controlling factor in the care of communicable disease is the maintenance of medical asepsis. By this is meant "the securing of surgical cleanliness in the nursing of communicable diseases." It emphasizes the avoidance of anything which has become unavoidably contaminated. It aims to confine infection to the fewest number of articles possible, and also to prevent outbreaks of infection in hospital wards and in the home by the application of the principles of technique based upon the theory of contact infection."[3] When it is suspected or known that a patient is suffering from some disease which can be transmitted to others by contact, it is necessary to isolate such a patient; that is, "to separate him from other persons, in such places and under such conditions as will prevent the direct or indirect conveyance of the infectious

[2] *Ibid.*, p. 277.

[3] Isolation Hospital of St. Louis, *Comm. Disease Nursing Routine*, pp. 3, 4.

TABLE I. Length of Incubation, Placarding, Isolation, Quarantine and Communicability

Disease	*Average Incubation Period*	*Minimum Length of Placarding or Quarantine Period for Quarantinable or Placard Diseases*	*First Symptoms*	*Periods of Communicability*	*Isolation Period for Contacts*
Chickenpox	2–3 weeks	10 days (Pl)	Eruption	Until lesions on skin and mucous membrane disappear	From 10th to 20th day after first exposure unless under daily inspection
Diphtheria	Usually 2–5 days	14 days	Croupy cough or sore throat	As long as virulent bacilli persist. Two negative cultures are necessary for release	Until cultures are negative
Dysentery	2–7 days		Cramps and diarrhea	As long as organism is contained in bowel discharges	None
Epidemic Encephalitis	About 10 days	21 days		Probably during febrile stage	None
Erysipelas	3–10 days		Inflammation of skin	As long as lesions remain	None
German Measles	14–21 days (P)	5 days	Cold, cough	8 days from onset of disease	None
Gonorrhea	1–8 days		Discharge	As long as organism persists in discharges	None
Impetigo	Uncertain		Sores	As long as lesions remain	None
Measles	About 10 days	10 days (I)	Lachrymation, Cough	From 4 days before until 5 days after rash appears	From 7th to 17th day after first exposure unless under daily inspection
Meningococcus Meningitis	2–10 days	14 days 2	Headache, temperature	As long as organism is present in mouth and nose	One week after last contact with case
Mumps	12–26 days	14 days (I)	Swelling of jaw	Unknown	From 15th to 22nd day after first exposure unless under daily inspection
Para-typhoid Fever	4–10 days		Temperature	From prodromal symptom until bacilli disappear	None
Poliomyelitis	Usually 2–3 days	21 days	Malaise	Uncertain, perhaps 21 days	10 days after last contact with case
Ringworm	Unknown		Crust	Until lesions are healed	None
Scarlet Fever	2–7 days	21 days (I)	Sore Throat, fever, often vomiting	Until 8 weeks after onset and until all discharges have ceased	One week after last contact with case
Smallpox	8–16 days	14 days (I)	Like Influenza	Until skin is entirely clear	Vaccinate all contacts within 72 hrs. Observe following exposure for possible illness with smallpox
Typhoid Fever	7–23 days	Neg. stools (I)	Malaise	As long as bacilli are discharged. In case of carriers, may be for yrs. See Sec. XII, p. 16.	None
Whooping Cough	Usually 7 days, may be 10 days	21 days from beginning of characteristic whoop (I)	Cough	In early stages and until after whoop begins	14 days from date of last contact except when under daily inspection

agent to susceptible persons."[4] The theory behind this technique is that infections are transmitted by actual contact — either direct or indirect.

There are two ways in which patients suffering from communicable diseases are cared for ordinarily:

1. the disease-unit plan
2. the patient-unit plan

The two plans are the same in that they consist of areas representing the patient and all his contacts both direct and indirect, which have been contaminated by a distinct disease. The distinction in the plans lies in the fact that; in the former, patients suffering from the same disease are grouped in sections and the same nurse may go from one to the other without changing or scrubbing between patients; in the latter, there is no attempt made to keep the same diseases together; each patient forms a unit to enter which gown and a scrubbing technique is required, regardless of how many cases of the same disease may be in the same ward.

Whichever method is selected, its efficiency depends

[4]Bower, A. G., and Pilant, E. B., *Commun. Disease for Nurses*, p. 18.

upon and is maintained by the practice of concurrent and terminal disinfection of all discharges from the patient and everything which comes in contact with or is handled by him.

"By concurrent disinfection is understood the application of disinfection immediately after the discharge of infectious material from the body of an infected person, or after the soiling of articles with such infectious discharges, all personal contacts with such discharges being prevented prior to their disinfection."[5]

"By terminal disinfection is indicated the process of rendering the personal clothing and immediate physical environment of the patient free from the possibility of conveying the infection to others."[6]

Sunlight, very high temperatures, burning, boiling, steam under pressure as well as certain chemicals, such as alcohol 75 per cent, and lysol 2 per cent, are all disinfectants, which for the destruction of the causative agents of certain diseases are highly effective. Articles of little or no value can be burned, while boiling or steam are satisfactory for bedding, clothing, etc., where shrinking or running of colors will not result. Dry heat at 160° C. for one hour will destroy all forms of life. Moist heat or boiling at 100° C. for one hour will effect the same result. Boiling for 10 minutes is sufficient to render harmless practically all disease-causing organisms.

VII. The Planned Isolation Division

A. Location

With this background in mind it is possible to proceed to the description of the isolation unit which is being planned. Medical asepsis can be carried out anywhere in a hospital, but a quiet section of suitable size in a part which is segregated from the noncontagious departments and which lends itself readily to isolation purposes will serve best.

Connected with the medical floor of the main building of the hospital for which this unit is being planned, and closed off from it by doors, is an entire upper floor of the original hospital. At comparatively small cost, this can be arranged into an isolation division consisting of four patients' rooms, a diet kitchen, a utility room, a supply room, and a bathroom.

B. Physical Facilities

This unit has its own elevator and is also provided with a large porch. Patients will be accommodated in private rooms, which can be made into double rooms in case of necessity by the use of movable partitions. There will be a lavatory with running water, and a toilet in each room. Scrubbing facilities will be located in an alcove between each two rooms.

It is obvious that everything except absolutely essential furnishings must be eliminated, hence no curtains, draperies, or ornaments of any kind will be permitted in the unit. Furthermore the necessary equipment must be of a nature to permit frequent washing with soap and water. In each room a tray with a comb, soap, toothbrush, toothpaste, and a thermometer will be provided for the occupant, as well as a basin for washing, and such articles as bedpan, urinal, enema, and douche cans.

In the utility room there is to be a hopper for disinfecting linens, a gas stove, an incinerator. There will also be a closet to contain cleaning utensils.

The diet kitchen will be provided with sterilizer for dishes, an ice-box, gas stove, and sink.

The equipment of the supply room will comprise an autoclave, instrument sterilizer, and presses for linens, medications, treatment trays, and sterile supplies. An operating-room table and an emergency kit of instruments will be kept here to be used in cases of emergency. This room must be kept uncontaminated. There will be no space provided for contaminated articles except one waste container operated with a foot lever.

C. Nursing Personnel

A separate nursing staff must be provided for an isolation division. A head nurse will be in charge, assisted by two senior and one junior nurse. It will also be necessary to have a subsidiary worker to attend to the cleaning.

The student nurses who are sent to this division must first have had supervised experience in the care of cases of pneumonia, erysipelas, and venereal disease in the general hospital.

In case of necessity the general floor nurses who have had the above experience may be called in to assist the isolation staff.

D. Contaminated Areas

All floors are contaminated; patients will drop or upset things and may even expectorate upon the floors. All attendants must be prevented from putting their shod feet upon chairs. Should this happen accidentally these surfaces must be immediately disinfected. Floors should be washed up frequently and thoroughly. This will not, of course, make them clean in the medical sense though they will have every appearance of being perfectly clean in the housekeeping sense. Everything dropped on the floor should be destroyed or properly cleaned before being used again. Except for the floor, the patient's unit should be the only unclean area. The corridors, bathroom, kitchen, treatment room must be kept free from contamination. Patients will not be allowed in the corridors. No nurse nor doctor will wear the contaminated gown through the corridor unless carrying a patient, or if some emergency necessitates it.

Soiled linen will not be left in the unit. Paper bags will be fastened to each bed. The patient will be instructed to deposit therein anything which has been used to wipe away secretions. Doctors and nurses will place into these bags all applicators, tongue blades,

[5]Bower and Pilant, pp. 17, 18.
[6]*Ibid*, p. 18.

or any waste contaminated with secretions. Instruments used to examine a patient — stethoscope, head mirror, flashlight, ear and nose specula, opthalmoscope, otoscope, etc., should be cleaned up at once. Instruments will be washed in cold water and boiled if their nature permits boiling. The stethoscope, and like instruments, will be washed with soap and water, or a 1:60-per-cent phenol solution may be used. Everything which is contaminated should be cleaned up at once. Articles used in one unit must be disinfected before they can be used in another.

E. Gown Technique

A nurse must wear a gown over her uniform whenever she is working with a patient. A special technique based upon the principles of asepsis is required for this. The technique to be used will be as follows:

1. The nurse is uncontaminated and takes the gown from the hook.
2. She places her hands together and slips them into the sleeves of the gown, touching nothing except the inside of the gown as she slips it on.
3. She pulls up the sleeves without allowing the hands to touch the sleeves on the outside.
4. With the hands still uncontaminated she ties the strings at the back of the neck and at the waist.

1. Removing the Gown

1. The nurse scrubs her hands one minute.
2. She unties the neck strings, and the strings at the waist.
3. She scrubs her hands for one minute.
4. She slips her right finger under the left cuff and pulls off the left sleeve.
5. The right sleeve is handled with the covered left hand.
6. Working out of the sleeves in this manner, the nurse folds the gown from the inside, keeping the shoulder seams together, and then hangs the gown on the hook.

After the gown has been removed the nurse must scrub from the elbows down for two minutes using a brush. Hand lotion is to be applied after each scrubbing.

2. Physician's Gown

The physician should be requested to remove his coat and wrist watch, roll up his sleeves and don a gown before calling upon a patient. Hands must be scrubbed for two minutes before going to another unit. He must change his gown between each visit to a patient.

F. Maids' Technique

Floors may be cleaned without danger by subsidiary workers. The maid must wear a gown over her dress. She must be instructed not to touch anything in the room. If it is necessary to move a table or chair she can be shown how to do so with her foot or a clean paper to protect her hands. When sweeping under the bed she should be instructed not to let her broom or mop handles touch the bedding. Usually the patient can help in this by pulling the bedding up out of the way. Patients too sick to cooperate will have the bedding tucked in along the sides, so that the sweeping can be done without danger of contamination. She will be instructed not to pick up anything from the floor.

G. Garbage and Trash Cans

These containers will be collected on a truck kept for that purpose. The outside of the cans will be kept clean. The garbage is to be burned and the cans are to be thoroughly washed both inside and out.

H. Ice

Ice may be delivered upon a truck kept for that purpose. The iceman is to be instructed in floor technique.

I. Laundry

The linens used in this unit are placed in a hamper bag, the outside of which is kept clean. They are then to be conveyed to the utility room and emptied into the hopper to soak in a 2 per cent lysol solution for at least one half hour. (Typhoid linens must be soaked for six hours.) Stained linens may be soaked in cold water to keep the stains from setting. They may then be laundered with the general wash.

J. The Diet Kitchen

The diet kitchen is to be a clean area to which the food is brought from the central kitchen. Patients' dishes and trays must be sterilized for twenty minutes before the maids are permitted to touch them. The trays may be set up by the subsidiary worker, and are carried to the bedside by the nurse. If the patient is able to manage the tray alone, the nurse need not put on a gown. With both hands she is to slide the tray half way on the table. Then while the right hand supports the tray, with the left hand placed inside of the tray near the rim, she is to gently push it the rest of the way.

The trays are to be carried back to the diet kitchen by the nurse, where she will place them upon papers laid on a ledge near the sink. She is to scrape the solid waste into a paper bag which is burned. The liquid waste is to be emptied into a pitcher to be boiled or disinfected before being put into the sewer. The dishes are to be carried to the dish sterilizer and submerged with the trays as soon as scraped.

The subsidiary worker must be instructed in technique in so far as it affects her work. She must know that silverware dropped on the floor must be sterilized before being washed with the other dishes, and that unprotected hands which have picked up something from the floor must be scrubbed for two minutes before handling anything else in the diet kitchen.

Salt shakers and sugar bowls remain in the patients' units. They are to be filled by carrying salt and sugar to each unit in paper cups and filling the containers there.

K. Nursing Care[7]

1. Admission

When the patient reaches the hospital he is to be taken to the room he is to occupy by the ambulance driver and the orderly. The nurse then takes over his care. Having donned the gown and a cap, she removes the clothing of the patient and places it in a bag, the outside of which is kept clean. Later, she is to sterilize by steam all clothing that can be so treated. Woolens and silks may be aired for six hours. Leather goods are to be first washed with soap and water and then aired.

Money, cash, or currency may be disinfected by being immersed in phenol for ten minutes. Jewelry, other than watches, may be treated the same way. Watches may be carefully washed. Check books and bank books are to be sterilized under fifteen pounds pressure for thirty minutes. Letters are to be treated in the same manner and patients may write letters which will be sterilized before mailing.

The patient's temperature, pulse, and respiration are to be taken without contamination of the nurse's watch. Before putting on her gown the nurse places the watch on the bedside table on a clean paper. She returns for it after she has removed her gown. The doctor and laboratory are notified of the patient's arrival. The nurse is then to give the patient a bath if he is not too ill, and to make him as comfortable as possible.

The laboratory nurse takes care of the routine laboratory tests such as blood counts, urinalysis, and all cultures.

In most cases the doctor telephones his orders, if he doesn't actually accompany the patient. After carrying these out, the nurse goes to the alcove without allowing her gown to touch anything and washes her hands for two minutes, manipulating the soap and water by means of foot levers. She then removes the gown and scrubs for three minutes before charting the admission, the temperature, pulse, and respiration, condition of the skin, scars, bruises, or abrasions; if a rash be present it is to be described as to kind, distribution, and general character.

2. Taking the Temperature, Pulse, and Respiration Routinely

Unless the patient is resistant, this may be done with hand contamination only and without the use of a gown.

3. Serving Medicines

The medicines are prepared on a tray. The nurse, without a gown, carries the tray to those patients who can take their medicine without assistance. She leaves it on the table of anyone too young or too ill to help themselves. When all medicine is distributed, she puts on a gown and assists those patients who are still waiting. She must scrub and change between each patient. When all medications have been given, without being gowned she collects the glasses, washes them at the hopper and puts them on to boil for fifteen minutes. She then scrubs her hands.

4. Taking Blood for Wassermanns, etc.

All apparatus for these procedures are to be placed on a clean towel on the bedside table. The body area is to be cleansed and the tourniquet applied without contamination of the hands. The blood is placed in a sterile tube held by the nurse. The syringe and needle are placed on to boil after being washed. The container holding the blood is labeled and the laboratory slips made out properly to accompany the blood to the laboratory.

5. Preparation of Biological Products, Serums, Vaccines, etc.

The nurse must know that all biologicals are to be kept in a refrigerator at a temperature of 40°F.; that the "expiration date" stamped on biologicals is to be watched; that just before using these products they should be warmed to body heat by being immersed in water heated to 100°F.; or by being held in the hand; that a hypodermic of 1 cc. of adrenalin (1:1000) should be kept in readiness when antitoxin or serums are to be given; and finally that most biologicals are aseptically sealed. Aseptic precautions must be observed in preparing them for use.

6. Blood Pressure

When blood pressure is to be taken, the bed is draped with a clean sheet and the sphygomanometer placed upon it. The patient's arm is exposed. A nurse in a gown should be present to control the patient if necessary. A clean towel is to be wrapped around the arm and the cuff applied over this. One hand manipulates the stethoscope, the tip of which is contaminated, and the other hand manages the bulb. When the readings have been taken the cuff is removed and the apparatus taken out of the unit. If the operator has been skillful, only the stethoscope requires disinfection.

7. Dressings

The dressing basket is to be taken from one patient to another, care being taken not to contaminate any of the equipment. Soiled instruments are washed and sterilized; soiled dressings placed in a paper container and burned at once.

8. Charts

Charts are to be kept at a desk in the hall. Entries will be made after the nurse is clean. Should she contaminate a chart, she is to pin it up in muslin and autoclave it.

9. Signing Documents

It may be necessary for a patient to sign a document or a check. A clean towel is placed on the bedside table, the document put upon that and covered with another clean towel, leaving only the surface for the signature exposed. The patient is given a pen or indelible pencil and the document held steady while the patient signs. The document and the nurse's hands are not contaminated. The towels are placed in the laundry or burned if they are of paper. Then pen or pencil is washed in a 2 per cent lysol solution.

[7]Bower & Pilant, pp. 23–49. Perkins, *Essentials of Ped.*, pp. 378–93. Pillsbury, pp. 141–50.

10. Treatment Equipment

Medications and small articles, drops for nose, ears, eyes, etc., are to be kept in the room if used for daily treatments. When irrigations are given daily the can may remain with its stand, though covered when not in use. Irrigating tips are to be boiled after each using. Basins for ice or solution should be kept in the room.

Bedpans and urinals should be washed and disinfected after use.

11. Hypodermic Injections

Hypodermics are prepared in the medicine room and carried to the patient with the needle wrapped in cotton soaked in alcohol. The area is then cleansed and the injection given. After the syringe and needle are placed in the sterilizer, the hands are scrubbed and the operation charted.

12. Visitors

Only unusual circumstances should necessitate the presence of visitors in the patients' rooms. Visitors must be carefully instructed, covered by a sleeveless gown and seated on a chair covered with a clean sheet, so that the contact with the bed and the table can be avoided. A window is to be cut in each door, glassed, and protected by a shade. Through this visitors may ordinarily see the patient and carry on some conversation by means of notes written in large handwriting or with colored pencils.

L. Nursing Measures in Specific Diseases

The general nursing measures may perhaps be best illustrated by describing some of the special care necessary for two types of communicable disease; namely, typhoid and measles.

Fever and toxemia are present in a more or less marked degree in all communicable diseases; therefore the underlying principles of the treatment and the nursing care are the same. Harmer[8] says that the treatment includes the early administration of the specific vaccine or serum if one exists for the disease; environmental and personal hygiene; observation and relief of annoying symptons and discomforts.

Fresh air in abundance is highly desirable in all diseases, but especially is it beneficial in typhoid fever as it stimulates the vital centers.

Sunlight is highly desirable but the light must be regulated so as not to cause discomfort and annoyance to the patient. Special precautions in this regard are necessary in measles.

Rest is required because the body is being destroyed and the heart and blood vessels being overworked, also because the body is putting up a tremendous fight against infection. All energy possible must be conserved. The amount of rest is a necessity in typhoid fever. The disease runs a long course of six weeks or more; the toxins are most poisonous; depression of vital functions and tissue destruction are extreme, with coma frequent. It is not difficult to see how very exhausting a disease this is and how it leaves the patient without resistance to withstand a secondary infection or complication. No visitors should be allowed, for the mental effort of response to them causes an elevation in temperature and pulse rate, restlessness, and wakefulness.

Quiet is very essential to the feverish toxic patient. Noise should be eliminated as much as possible in and around the hospital by making the staff and employees noise conscious. Rubber heels should be worn, moderate voice tones (not whispers) should be used, dripping faucets and hissing radiators should be turned off, dropping utensils should be avoided, and objects lifted rather than dragged.

No single factor adds as much to the patient's comfort as does the daily cleansing bath. Special care is necessary in a case accompanied by a skin eruption as in measles, when soda bicarbonate is frequently added to the bath water to allay itching and burning. Care should be taken never to use cold water upon a measles patient.

Bath water is to be disinfected by having equal parts of lysol added and allowed to stand for one hour before being emptied.

In typhoid fever the care of the skin is especially important. The hands must be washed several times a day for the patient, as the chief means of contagion is by way of the patient's excreta; a local cleansing bath should be given after each defecation. The excreta should be disinfected before disposal by pouring over them a sufficient quantity of a disinfectant to cover them for one half hour. Due to poor circulation and the destructive effects of the fever and toxins there is great danger of pressure sores developing. The possibility of the patient becoming incontinent adds to the danger. Rubbing the exposed surfaces with alcohol and painting them with tincture of benzoin every two hours will help to prevent decubitus. The use of a rubber ring and frequent turning will also help. Bed linen must be kept dry, smooth, and free from crumbs.

The mouth must be kept clean and moist by frequent cleansing and the use of mouth washes. The lips should be kept moist and protected by cold cream.

In typhoid fever, if the mouth is neglected, it becomes dry and the tongue coated. Crusts form with fissures which are extremely painful. Infections may follow from this, a very common one being parotitis which often develops in the third week. Applying cold cream to the lips and tongue every half hour and giving plenty of fluids aids in keeping the mouth in good condition.

The nose must be cleansed frequently. Dry secretions should not be allowed to form. Nose drops and sprays are often prescribed and afford great relief. This care is especially necessary in measles in which the secretions contain the organisms of the disease.

The ears should be examined daily and symptoms of pain, irritability, temperature rise or discharge, should be reported without delay. Otitis media is a

[8]Harmer, Bertha, *Principles and Practice of Nursing*, p. 588.

frequent complication of measles and all diseases of the upper respiratory tract.

The eyes in measles and wherever their secretions are increased should be given special attention. They should be cleansed with boric solution several times daily. Light should be carefully regulated in these diseases, and also in typhoid fever during the toxic stage when the eyes are kept open very wide and so often become irritated.

In all infectious diseases the eliminations should be carefully watched and recorded. In typhoid fever this is especially important. The intestine is the seat of the lesions. Improper care may result in hemorrhage or perforation, distention or tympanites. Great care must be taken in the use of the bedpan to avoid straining; and where perforation is feared, a large pad is substituted for the bedpan.

The kidneys are stimulated and flushed by the large amounts of fluids administered. Typhoid bacilli may be eliminated in large numbers in the urine, particularly if there is retention.

When a disease is prolonged, as in typhoid fever, the diet is of particular importance. The average adult should have four thousand calories a day. While the fever is high, nourishing liquids should be given, as milk, cream, buttermilk, eggnogs, cream soups, and fruit juices. Gruels follow and, as the patient can tolerate them, potatoes, beef juice, cottage cheese, stewed fruits without seeds, soft eggs, etc. The nourishment should be given at least every three hours. The fluid intake should be three or four quarts a day.

Typhoid patients recover slowly. They should be kept in bed until the pulse rate is normal and should be warned against strenuous activity.

The patient with measles recovers quickly once the rash is well developed, if there are no complications. He should remain in bed until the cough is gone and have the eyes protected from bright light for some little time.

Conclusions

From the "setup" of the unit herein described and its working application in the care of these two diseases of different types, though both belonging to the general class known as communicable diseases, it will be seen how necessary at least one such set-up is in a town of any size. No home can hope to be provided with the equipment which is necessary. Few homes can provide expert nursing care, and few families can undertake to keep such a patient in its midst. It is impossible without systematic training and energetic practice to understand the principles necessary to control the spread of such cases, or afford them sufficient nursing care in the face of the numerous sequelae which threaten. Uncomplicated measles is rarely dangerous. It is the complications that kill or cause lifelong illnesses. So too in typhoid. How many in homes are competent to really care for even the simplest forms of these diseases and to prevent their spread to others? Too, in the case of typhoid, just as grave complications threaten in the lightest case as in the most severe.

As for the nurse, the study and care of these diseases, comprising as they do a review of all the principles and methods which students have learned in the care of other diseases, afford them not only the opportunity to improve their knowledge and perfect their art, but also to learn to apply it to a new situation with the added factor of communicability to study. These patients are not only subject to all the discomforts previously studied, but also to a host of varying complications, which may be prevented and will certainly be helped to a cure by the vigilance of the trained nurse.

Bibliography

Bower, Albert G., and Pilant, Edith B., *Communicable Diseases for Nurses*, 3rd ed. (Philadelphia: Saunders and Co., 1937).

Carey, Harry W., *Handbook of Bacteriology for Nurses*, 3rd ed. (Philadelphia: Davis Company, 1930).

Carter, Charles F., *Bacteriology for Nurses* (St. Louis: The C. V. Mosby Co., 1928).

Carter, G. G., "Strict Aseptic Technique is Required in the Contagious Unit," *The Modern Hospital*, Vol. XLI, No. 3, Sept., 1933, pp. 67–69.

Golub, J. J., "Hospital Procedures," *The Journal of the American Medical Association*, Vol. 112, No. 5, Feb., 1939, p. 418.

Grulee, Clifford G., and Munns, George F., "A Review and Report on Contagious Hospitals in the United States and Canada," *Hospitals*, Vol. 2, No. 2, Jan., 1937, pp. 88–92.

Harmer, Bertha, *Text-Book of the Principles and Practice of Nursing*, 3rd ed. (New York: The Macmillan Company, 1934).

Hoxie, George Howard, *Medicine for Nurses*, 2nd ed. (Philadelphia: Saunders Co., 1929), pp. 20–46, 124–135.

Iowa State Department of Health, revised and adopted July, 1938, published by the State of Iowa.

Jeans, Philip C., and Rand, Winifred, *Essentials of Pediatrics*, 2nd ed. (Philadelphia: J. B. Lippincott Company, 1936).

Jensen, DeBoran MacLevey, and Jensen, Julius, *Medical Nursing* (New York: Macmillan Company, 1932), pp. 33–43.

Manual and Outline of Procedures for Health Officers for the Control of Communicable Diseases. Second reprint. Issued by the Department of Public Health, State of Illinois, Dec., 1937.

Matson, E. F., "Medical Asepsis," *American Journal of Nursing*, New York, Vol. XXIII, No. 1, April, 1933, p. 335.

Meier, Gertrude M., "A Successful Teaching Outline for a Communicable Disease Service," HOSPITAL PROGRESS, Vol. XVIII, No. 4, April, 1937, pp. 113–115.

McRae, A. J., "Planning for Communicable Diseases," *Transactions of the American Hospital Association*, Chicago: Vol. XXXIX, published by the American Hospital Association, 1937, pp. 680-687.

Nursing Procedure Manual, Saint Louis University Hospitals, Saint Mary's Group of Hospitals. Prepared by the Sisters of Saint Mary, Saint Mary's Hospital, Saint Louis, Mo., 1938, pp. 244–249.

Perkins, Ruth Alice, *Essentials of Pediatric Nursing*, 2nd ed. (Philadelphia: Davis Company, 1932), pp. 383–392.

Pillsbury, Mary Elizabeth, *Nursing Care of Communicable Diseases*, 2nd ed. (Philadelphia: J. B. Lippincott Company, 1931).

Rockwood, H. L., "Contagious Disease Control in a General Hospital," *Hospital Management*, Vol. 40, No. 2, Aug., 1935.

Rogers, Margaret A., "How Children's Hospital, Detroit, Checks Contagious Disease," *Hospital Management*, Vol. XXXVIII, No. 6, Dec., 1924, pp. 22–23.

Sellew, Gladys, *Pediatric Nursing*, 2nd ed. (Philadelphia: Saunders Company, 1938), pp. 403–447.

Specific Nursing Measures Apposite to Blood Transfusions in Infants

Roberta Catherine Beal, R.N., B.S.

Historical Review

THE history of blood transfusion forms an interesting chapter in medical progress. Though the use of blood as a therapeutic agent dates back to the time of the ancient Egyptians, who used it as a resuscitative medium and a health restorer, the first transfusion of blood of which we have record was not given until 1492. At this time, we are told, an operation was performed by a Jewish physician on Pope Innocent VII, which cost the lives of three boy donors without helping the Pontiff.

The discovery of circulation by Harvey in 1616 was followed by the first recorded transfusion. It was performed by Francesco Folli, a Florentine physician who used the following procedure: He inserted one end of a silver tube in the artery of the donor and connected the other end of this tube to a cannula of bone in the vein of the recipient. At Oxford, in 1665, Richard Lower performed the first successful transfusion on animals. And the next year, in Paris, Jean Baptiste Denis successfully transfused a fever-stricken human being. Attempts to repeat this operation were not so fortunate, and after Jean Denis had narrowly escaped death for murder, blood transfusions were prohibited in Paris unless the Faculty of Medicine approved of them. This marked the beginning of the struggle between the imperfect attempts of experimenting physicians and a decidedly skeptical public regarding blood transfusions.

At this time, too, the tendency of physicians to use transfusions as a therapeutic measure in the treatment of the insane or senile led many, because of unsuccessful results, to lose confidence in this procedure.

Constructive work began with the experiments of James Blundell, a London physiologist and obstetrician. He sought a means of combating puerperal hemorrhage. By experimenting on dogs he discovered the principles that the use of blood from animals of a similar species was a means of preventing death from hemorrhage, that blood passed through a syringe retained its life-giving properties, that venous blood might be used satisfactorily in amounts smaller than those of the blood lost. He, accordingly, devised a simple syringe with a three-way valve similar to that used today, and with it he successfully transfused eleven human beings. A number of surgeons, chiefly in England, followed Blundell's example. Success did not always come but progress resulted.

Blundell's success aroused the enthusiasm of many physicians regarding blood transfusions. Such diseases as uremia, syphilis, etc., were brought under the treatment of transfusions. However, with the growing use of transfusions, there was a corresponding increase of severe reactions and fatalities. The result was that the popular hopeful attitude toward transfusions began to wane, and even physicians began to doubt the efficacy of blood transfusions.

In 1847, Larsen, at Panum's suggestion, first transfused defibrinated blood. Probably the greatest achievement and the most important single discovery in the history of blood transfusions was the demonstration in 1900, by the Austrian Landsteiner, and independently by the Englishmen, Shattuck, of the presence of iso-agglutinating and iso-agglutinable substances in the blood.[1] Landsteiner divided blood into three groups with regard to their agglutinating actions. In 1902, Decastello and Stiner added a fourth group. Jansky, in 1907, worked out the reciprocal agglutinating reactions of the four groups and classified them accordingly. In 1910, Moss, working independently, confirmed Jansky's observations. Thus, the greatest danger of blood transfusions, the presence of reciprocal agglutination substances, was explained and eliminated. The remaining difficulty was purely technical.

Various attempts were made to facilitate the transfer of blood. Coagulation presented the greatest difficulty. The technique for blood-vessel anastomosis perfected by Carrel in 1905 could be used only by very skillful surgeons. In 1907 Crile introduced the method of cuffing the artery back over a cannula and tying the vein over it. The advent of reliable indirect methods finally superseded the direct method of transfusion.

In 1911, from Curtis and David came the redemonstration of the principle concerning temporary noncoagulation of blood in paraffin-coated vessels. Unger's double syringe for blood and saline in both donor and recipient marked a popular advance in 1915. Experiments with anticoagulants began with the suggestion of Hirudin by Landais in 1892. This solution was used by Satterlee and Hooker in 1914, and finally rejected because of its toxicity. In the same year, sodium citrate and glucose were used by Hustin in Belgium. On November 14, Agote, in Buenos Aires used citrate alone for the first time. The standardization of the dosage and technique of this method by the independent experiments of Lewisohn and Weil in this country made blood transfusing simple and practical. Increasing popularity followed its use on the wounded

[1]Michael DeBakey and Edith Honold, *International Medical Digest*, "Blood Transfusion," Nov., 1937, p. 305.

during the World War and continued thereafter, until today, the transfusion of blood is firmly established as a successful therapeutic measure.

Physiological Consideration

Another subject which should be touched upon before continuing with this thesis is that of the clotting of blood. The blood contains four substances concerned with the clotting of the blood. They are: fibrinogen, calcium salts, thromboplastin, and prothrombin. In the process of clotting, prothrombin, thromboplastin, and calcium salts form thrombin which in turn changes the fibrinogen to fibrin, which is insoluble. This fibrin forms an interlacing network — in the very small meshes of which the blood corpuscles are entangled. The liquid part of the plasma which remains after the subtraction of fibrin is called serum. Although many factors are known which modify the speed and extent of fibrin formation, no exact analysis of the phenomenon of clotting has been reached. It must be remembered that in order for the blood to clot, the two agents concerned with the prevention of clotting must be neutralized. These two agents are antithrombin and antiprothrombin (heparin). It is thought that these substances are neutralized by tissue extract which is set free by the crushed tissue cells, the blood corpuscles, and the platelets. This accounts for the fact that the blood clots only when tissues are wounded.[2] The normal clotting time for adults is about five minutes.

As a way of contrast we might observe the following information about the blood in the newly born and early childhood.

At the time of birth the total volume of the blood, the number of erythrocytes, and the hemoglobin content is higher than at any other time of the life. The volume of the blood at birth is stated by Lucas and Dearing to average 14.7 per cent of the body weight. After the neonatal period this volume falls to 9 or 10 per cent of the body weight.[3] If infants are underfed or become dehydrated, the absolute volume of the blood is decreased. This decrease results in a marked impairment of the circulation. Due to the fact that the volume flow in the internal organs is also decreased, there is a diminished degree of absorption from the gastro-intestinal tract. Functional incapacity of the heart may also result.

At the time of birth the hemoglobin content varies from 100 to 120 per cent (based on a scale of 100 per cent for the normal adult). This usually falls to about 90 per cent by the third week, after which it slowly decreases for the next four or five months. From this time on the hemoglobin content depends upon the type of feeding the infant gets. If only milk is given there will be a progressive decrease in hemoglobin content. The fluctuations in the hemoglobin content are to be explained by the fact that as the infant grows the blood volume increases proportionately, the total volume of new blood formed during the first year of life amounting to from 600 to 750 cc.[4] In order to maintain a normal hemoglobin content of the newly generated blood, iron must be given in the food, so considerable amounts of hemoglobin may be manufactured in the body.

In the full-term newly born infant the red blood corpuscles number about 5,000,000 per cubic millimeter and are sometimes as high as 7,000,000. During the first week of life, nucleated red blood cells may be present, but these disappear under normal conditions. The number of red cells diminish to 4,500,000 or 5,000,000 during the first week of life, and remain so throughout the first year of life.

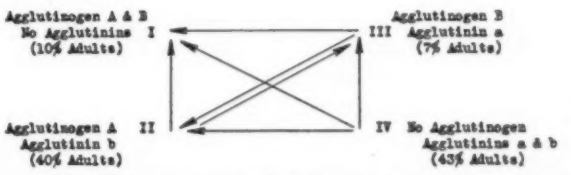
At birth the white blood cells number from 15,000 to 20,000 per cubic millimeter. This number drops to between 11,000 and 14,000 by the end of the second week. For the next two years the number remains around 12,000.

When the second year is reached, the blood gradually begins to assume the adult type. This is not finally attained until from the fifteenth to the twentieth year.

Blood Typing

As regards the testing of blood before a transfusion, certain routine steps are necessary. Although these preliminary steps are adequately taken care of in the laboratory by a trained technician, nevertheless every nurse should have some conception of the methods employed and the results obtained. For donors healthy adult individuals should be selected. Before the donor can be used it must be determined that he has a negative Wassermann, and has blood which is compatible with the recipient's blood.

When blood is classified by one of the common methods according to the distribution of iso-agglutinins, four main groups are recognized. According to Moss these types are called Groups I, II, III, and IV. The diagram below, devised by Sanford, shows the Moss System of Iso-agglutinogen groups for blood matching.



Red cells have two agglutinogens A and B, making it possible for them to be agglutinated. Plasma has two agglutinins a and b. For blood to become agglutinated, an agglutinogen and agglutinin of the same letter must come together; cells having agglutinogen A will be agglutinated only by plasma containing agglutinin a, etc. For instance, the red cells of a person of group II (ab) will be agglutinated by plasma of a person of group III (Ba) or of group IV (ab) since the plasma of group I (AB) or of its own group, group

[2] Diana Kimber, Carolyn Gray, and Caroline Stackpole, *Textbook of Anatomy and Physiology*, p. 237.
[3] William Marriott, *Infant Nutrition*, p. 27.
[4] *Ibid.*, p. 28.

II, since the plasma of these groups does not contain agglutinin a. The red cells of group I (AB) will be agglutinated by plasma of all other groups and since group IV (ab) contains no agglutinogens, its cells will not be agglutinated by any of the other groups.[5]

Because of certain confusion that has arisen from the dissimilarity in numbers used in the Moss and Jansky classifications the classification by use of letters as suggested by Landsteiner is now more frequently used. The two classifications are harmonized as follows:

Moss Classification	Landsteiner Classification
Group I	Group AB
Group II	Group A
Group III	Group B
Group IV	Group O

Blood in the same group is usually compatible, but sometimes this is not the case. This is believed to be due to the existence of less common groups separate from the four groups. For this reason it is necessary to cross-match the donor's and recipient's blood. In cross-matching, a drop of the recipient's serum is mixed with a drop of the donor's cell suspension, and a drop of the donor's serum is mixed with a drop of the recipient's cells on another slide. After 30 or 45 minutes one can determine whether agglutination or hemolysis has occurred.

In cases of extreme emergency, blood of group IV may be used for any of the other three groups, since if it is introduced into the blood of the recipient very slowly, it will be so diluted as not to agglutinate the recipient's red cells, and having no agglutinogens cannot be agglutinated by the blood of any other group. This group is called the universal donor.

The blood may from the time of birth show distinct differentiation in the usual blood types and groups. It is, therefore, as necessary to match the blood for transfusion of the infant as in the case of older individuals. Strange to say, the mother's blood is not always compatible with that of the infant.[6]

Role of the Nurse

It is the duty of the nurse to see that all the necessary tests are completed and all the results recorded before the transfusion is started. When a patient is likely to receive a number of transfusions the nurse can be of valuable assistance by providing a number of donors, so that when transfusions are required, no delay results in an effort to secure suitable donors. This provision may often be of vital importance in preventing discomfort to the patient and dissatisfaction on the part of the physician.

At the time a transfusion is ordered the nurse can do much toward allaying the fear which naturally arises in the minds of the parents of a child who is about to get the transfusion. Although transfusions are now used frequently, they are still comparatively new, and many people, not familiar with hospital procedures, still have the idea that transfusions are resorted to only as a final measure. The nurse can by a brief explanation of the beneficial effects of transfusions, dispel worry and anxiety from the parents.

Those who daily witness all kinds of pathological diseases with their accompanying drastic effects on patients are at times apt to forget that these sights are not at all familiar to the average parent. These people endure much unnecessary anxiety and suffering which the nurse can prevent by a little discretion and consideration.

Indication for Transfusions

The indications for transfusions in infants are numerous. At present blood transfusions are considered one of the most valuable therapeutic procedures in medicine. Some of the major indications for transfusions are:

Severe anemias not associated with hemorrhage which occur in infants. These are usually in the nature of secondary anemias which may have a variety of causes. They may be caused by the destruction of red blood cells, as in malaria, sickle cell anemia, and hemolytic jaundice. Secondary anemias result also from acute infections such as pneumonia, scarlet fever, diphtheria, influenza, and from chronic diseases such as syphilis, tuberculosis, and nephritis. In all such cases of secondary anemia small administrations of either whole or citrated blood are helpful in the progress of the patient's recovery, and in cases where the anemia has progressed far enough to produce severe symptoms, transfusions may be life saving.

Transfusions have also proved valuable in severe cases of malnutrition when the baby has been allowed to become very emaciated. As the malnutrition progresses, the red blood cells diminish, and the hemoglobin content of the blood is much decreased. There is also a destruction of blood protein which causes a decrease in blood volume, and this in turn causes poor circulation. These infants have less resistance to infections. In many of these cases the failure to gain is evidently due to incomplete utilization of food. This failure of digestion and absorption is in part to be accounted for by the poor circulation resulting from decreased blood volume. Transfusion in such cases is likely to be followed by improved digestion and absorption of food, so that weight gains may occur without further changes in the diet. Transfusion also seems to increase the resistance to infection and often is followed by improvement in appetite.[7] It is important, however, that transfusions should never be given during the stage of acute dehydration or anhydremia, but that the fluids should be restored first; otherwise the transfusion may increase the concentration of the blood

[5]Diana Kimber, Carolyn Gray, and Caroline Stackpole, *Textbook of Anatomy and Physiology*, p. 240.

[6]William Marriott, *Infant Nutrition*, p. 31.

[7]*Ibid.*, p. 230.

and result in an exacerbation of all the symptoms of dehydration.

In some premature infants, transfusions are indicated. These infants tend to be anemic because of the relatively small amount of iron which is stored in the liver of the premature infant. It is believed that mobilization of iron in the fetal liver does not occur until the later months of pregnancy.[8] In the early months of the infant's life it receives food which contains little iron, but in the full-term infant there is a sufficient store of iron in the liver to provide for the formation of the required amount of hemoglobin. In order, therefore, to compensate this deficiency, transfusions are often advisable and even necessary in the premature newborn.

Anemia is not the only indication for transfusions. Frequently one will see a pale, undernourished infant whose red-cell count and hemoglobin are normal, but who are actually suffering from greatly decreased total blood volume. In the condition of anhydremia, the red-blood count is sometimes above normal, but there is a lack of water in the blood. These infants in spite of the lack of anemia are in need of and greatly benefited by transfusions.

In the severer types of diarrhea, repeated transfusions with citrated blood are of the greatest benefit. They help to overcome the anhydremia which often results due to the great loss of fluids in the numerous stools. The increase in blood volume, which results from the transfusion, leads to improvement in the digestion and absorption of food. Injection of blood also supplies materials for the reconstruction of damaged body cells and may have some effect in increasing the infant's resistance to infection.[9] Here again it must be remembered that it is best to restore the fluid balance of the body before transfusing the patient. The best time to give the first transfusion is from 12 to 24 hours after the initial fluid injection. The transfusion seems to make the beneficial effects of fluid administration more lasting and serves to maintain the blood volume better than when the fluid is given alone.

Hemorrhage, which is fairly common in the first few weeks of life, also presents an indication for transfusion. The hemorrhage may present itself in the form of an intracranial hemorrhage or in breech deliveries, hemorrhage from the rectum or vagina. Bleeding from the cord may also be quite severe. Experience has shown that the most efficient prophylactic or immediate treatment for hemorrhage is the injection or transfusion of whole blood.

Transfusions have been widely used in cases of primary pneumonia in infants and children. The belief held by some that transfusions in such cases are contraindicated because it increases the load of an already over-taxed myocardium and pulmonary circulation, seems overshadowed by the fact that the severe dyspnea and cyanosis present in some children is improved instead of made worse by transfusion. In many cases the administration of blood seems to bring on the crisis in a much shorter time than it normally takes, and the patient recovers in a shorter period of time with less complications resulting. No exact explanation for the beneficial effect of blood transfusion in pneumonia is known. Besides correcting the anemia which usually results, it seems to have a more important effect. It is thought that it might be possible that the transfusion stimulates an increase in segmented polymorphonuclear leucocytes — an increase of which seem to attend the crisis in such cases. In the few studies which have been made, the ratio of segmented to nonsegmented forms appears to be a good indication of the severity of the infection and the ultimate outcome. It is thought that transfusions may act as a form of serotherapy which introduces neutralizing antibodies or causes nonspecific protein shock. The increase in the blood volume may aid in overcoming cardiac weakness. It may also supply cells to carry needed oxygen to the tissues to replace those withdrawn from the circulation by the pathologic process.

In the whole field of infections transfusions seem valuable. The human adult blood seems to carry some immune properties against many of the ordinary infections, and its introduction into the patient's body seems to stimulate the organic defenses already insufficient or decreased. In severe cases of infection the administration of blood often prolongs the patient's life sufficiently for the antibacterial forces to overcome the infection. This would be sufficient reason for giving a transfusion in the case of any severe infection occurring in infants if no contraindications are present. In sepsis in the newly born, which is caused by the entrance of some form of pathogenic bacteria into the body, transfusions are sometimes used. Even in its mildest form septic infection of the newly born is very serious. The red blood cells are decreased by disintegration and the leucocytes are increased. Blood transfusions in such cases help to increase the number of red blood cells as well as aid the body in fighting the prevailing infection.

In addition to the above mentioned indications, transfusions are also given to prepare an infant for a major operation. It is thought that by giving a transfusion before and immediately after the operation, the chance of shock is practically ruled out. In preparing for mastoidectomy and as an adjuvant in convalescence, transfusion seems to have won a well merited place. Where shock does occur, after operations for such conditions as congenital pyloric stenosis or intussusception, transfusion frequently brings about almost immediate recovery from this shock.

Transfusions are frequently given, not for the primary diseases but for the complications which arise, such as streptococcus hemolyticus bacterima in scarlet fever, broncho-pneumonia, and mastoiditis in measles, and sinus thrombosis in mastoids. They also serve

[8] *Ibid.*, p. 258.
[9] *Ibid.*, p. 258.

as a general tonic later in convalescence when the patient's blood has been depleted by the more delayed complications, such as cervical adenitis or nephritis. The patient is sometimes deficient in what is called recuperative powers, and the administration of blood steps up slow progress.

The given number of indications in no way exhausts the known list for transfusions in infants. In practically all cases where an infant is suffering from anemia, marked prostration, shock, toxemia, hemorrhage, septicemia, acidosis, etc., transfusions have proved beneficial.

The following cases illustrate some of the practical applications and the satisfactory results of transfusions:

Case I

Chart No. 8072–34
Female — Age 2 years

Diagnosis on admittance — Dysentery (Shiga type)
Chief Complaints — Fever (maximus 104 degrees Fahrenheit rectally) and diarrhea.

The onset of this baby's illness was on October 14. It was accompanied by an elevation in temperature and a severe diarrhea. The following day the child had a convulsion and was brought into the hospital. On admittance, she appeared to be in a state of dehydration due to the fact that she was having from 27 to 30 bowel movements daily. One hundred cubic centimeters of citrated blood was given intravenously into the median basilic vein shortly after her entrance to the hospital. No untoward reaction followed. The patient was also started on protan chalk mixture every three hours along with a formula of boiled milk and boiled water. On the following day, five hundred cubic centimeters of normal saline solution was given under the skin to the child. At this time her maximum temperature was 101 degrees Fahrenheit rectally, and the child's condition was improved. After the twenty-ninth, the temperature was normal and softboiled eggs and dry toast were added to the diet. The patient was dismissed on November 4, at which time the stools were normal.

Case II

Chart No. 6596–36
Female — Age 2 months

Diagnosis on admittance — Malnutrition
Chief Complaints — Loss of weight and vomiting.

The baby was admitted to the hospital October 26, 1936, in a dehydrated condition as a result of vomiting for several days. The mother stated that the baby had been constipated for some time. The same afternoon the patient received five hundred cubic centimeters of citrated blood intraperitoneally. The following day she had a diarrhea and continued to vomit some of her feedings. Normal saline, one hundred and twenty-five cubic centimeters, was given daily until the baby stopped vomiting, which was about five days later. On November 9, when the baby was dismissed, the diarrhea was very much improved, and the feedings were being retained. At this time the baby's weight was 2170 grams in comparison to an admittance weight of 1715 grams. Here we see exemplified the fact that normal saline gives better results when given complementary with transfusions.

Case III

Chart No. 8774–39
Female — Age 2 years

Diagnosis on admittance — Bilateral otitis media

The baby was admitted on February 1, 1939, at which time both ears were opened. Normal saline and soda solution were used as ear irrigation every three hours. At this time the child's temperature was 98.6 degrees Fahrenheit rectally, and the next day it was 101 degrees. Two days later it was elevated to 103 degrees Fahrenheit. A myringotomy was again done on the left ear releasing a large amount of bloody drainage. On the seventh it was necessary to open the right ear, and on the thirteenth the left ear was again reopened. At this time the maximum temperature was 101 degrees Fahrenheit. The irrigations were discontinued, and five-per-cent mercurochrome was applied to the external ear. The drainage stopped for several days, but on the twenty-seventh the temperature went up to 104 degrees Fahrenheit. Both ears were opened for the third time, and a large amount of bloody drainage was obtained and the temperature increased to 104.8 degrees Fahrenheit. Neo-prontosil, grains five, was given twice daily, and the temperature dropped down to 100.4 degrees Fahrenheit. An X-ray of both mastoids, taken on March 6, showed the cells on both sides poorly developed and somewhat cloudy, and the anterior arm of the lateral sinus definitely thickened on both sides. The next day the child was given 175 cubic centimeters of citrated blood into the jugular vein, and was surgically prepared for the operating room. That evening the temperature was 104 degrees Fahrenheit. The operation revealed a complete destruction of all cells extending from the antrum outward, but the lateral sinus and the dura were not involved. A bilateral mastoidectomy was done, and the patient was brought back to her room in good condition. The following day the temperature again became elevated to 104 degrees Fahrenheit at four o'clock p.m. Three hundred cubic centimeters of five-per-cent glucose was given as an axillary seep. During the following 48 hours, the maximum temperature was 103 degrees Fahrenheit. On the patient's ninth postoperative day, she was given one hundred and 25 cubic centimeters of citrated blood into the median basilic vein. On the fourteenth postoperative day the temperature began to subside and by April 5 it was normal. At present the baby is still in the hospital because it is still necessary that her wounds be dressed daily, but her recovery seems only a matter of time.

Case IV

Chart No. 957–37
Male — Age 2 months

Diagnosis on admittance — Marasmus
Chief Complaints — Vomiting and diarrhea

The baby was admitted with a temperature of 100.8 degrees Fahrenheit rectally. Two hundred c.c. of Hartman's solution was given immediately under the skin and repeated that evening. The next day fifty c.c. of blood was given into the scalp vein by means of the syringe method. One ounce of evaporated milk formula was given every three hours. Twenty-four hours later the same amount of citrated blood was given again. By this time the stools had become normal, and the temperature was also normal. The patient was dismissed six days later, at which time he was taking and retaining four and one-half ounces of formula. His dismissal weight was 3560 grams as compared to an admittance weight of 3400 grams.

Case V

Chart No. 8473–39
Male — Age eleven months

Diagnosis on admittance — Bronchopneumonia

The patient was admitted to the hospital with a temperature of 104 degrees Fahrenheit rectally. Five hundred cubic centimeters of normal saline was given as a hypodermoclysis. Tincture of benzoin inhalation was started, and sulphanilamide, grains five, was given every three hours. Evaporated

milk, water, and cartose formula, ounces three, was given every four hours. Late that evening, one hundred cubic centimeters of citrated blood was given intraperitoneally. Following the transfusion, the temperature went down to 100 degrees Fahrenheit. The following day it was necessary to do a left myringotomy. After the next forty-eight hours the temperature was down to 99.6 degrees Fahrenheit. The patient was dismissed after two weeks of hospitalization in good condition.

Transfusion Technique

There are two outstanding methods of blood transfusions; namely, the direct and the indirect. In the direct transfusion an anastomosis is made between the veins of the donor and the recipient. Because of the difficulty in preventing clotting, the apparatus and its use requires a precision of technique which can be undertaken only by those especially skilled. For this reason direct transfusions are usually carried out in the surgical department with the assistance of a trained personnel.

When the indirect method is used the blood is first drawn into a receptacle and then transferred to the vein of the recipient. When this method is used, an anticoagulant, such as sodium citrate must be added to the blood to prevent clotting. The blood is usually injected immediately after it is taken, but it may be preserved for a considerable length of time if kept at a temperature of 40 degrees Fahrenheit by refrigeration.

For the transfusion of infants, the citrate method has several definite advantages. In transfusing infants, only a small amount of blood is given, and by the indirect method a sufficient quantity of blood may be obtained from the donor to provide for several transfusions; the blood may be given to the patient without cutting down on the vein; it may be given more slowly because there is no danger of the blood clotting; the apparatus is simple and fewer assistants are necessary, and the superior longitudinal sinus may be used if necessary. In general this method seems preferable to the direct method.

Intravenous injections of blood are indicated when an immediate reaction is desired. The baby usually responds even at the time of the transfusion. The amount of blood given to an infant seldom exceeds more than 20–30 cubic centimeters per kilogram of body weight. More may be infused however to children who have diminished blood volume due to hemorrhage, and less should be given to children with pneumonia or cardiac diseases. It is thought that repeated small transfusions are usually more effective than the larger ones, because there is less danger of untoward reaction. The transfusions are usually not given more than once in twenty-four or 48 hours.

Citrated blood may be given to the infant either by the gravity method or by the force, or syringe method as it is sometimes called. As the term implies, in the gravity method the blood is allowed to run in by means of gravity, and the flow is regulated by a stopcock, a drip bulb, and a correctly gauged needle. The flow may also be regulated by the height at which the container holding the solution is placed. This method is of course widely used, and in the case of adults and older children is exclusively used. With certain infants, however, whose veins necessitate a needle so tiny that blood will not flow through it by gravity, the force method is the only one that can possibly be used.

First, let us consider the gravity method, and all those factors which will contribute individually to make it a success. Although the fundamental procedure is carried out by the physician; nevertheless, we know much responsibility in blood transfusions rests with the nursing staff. This responsibility usually consists in the preparation and care of the necessary equipment, the maintenance of asepsis, and the preparation and care of the patient. In most hospitals the taking of blood from the donor is a procedure which is carried out in the operating room and not on the pediatric division. However, the floor nurse should notify the operating-room supervisor of the transfusion so that she may see that necessary preparations are made. It is her duty also to notify the house doctor or intern who is to give the transfusion if she is aware that he has not been already informed. When the donor arrives the nurse must see that he is identified, and that the laboratory slip is sent with him to the operating room. A nurse can often be of valuable assistance in enabling a person, acting for the first time as a donor, to maintain his mental equilibrium by briefly giving him an outline of the procedure that is about to take place. This will prevent that natural perturbation arising from a state of suspense.

A duty for which the nurse is solely responsible is that of preparing and arranging the necessary equipment for the transfusion. This equipment is as follows:

I. Preparation tray consisting of:
- Sterile jar of cotton balls
- Alcohol 70 per cent
- Iodine 3 per cent
- Soap solution
- Tourniquet
- Safety razor

II. Sterile equipment consisting of:
- Sterile towels and sheets for draping
- 2 needles (The physician generally likes to choose the needles, but usually gauged 19 to 24, length 1½ inches are satisfactory, depending a great deal on the site of injection).
- Sterile flask (Varies according to hospital, but usually a 500 c.c. Florence or Salversan flask fitted with necessary rubber tubing and adaptors).
- 2 c.c. syringe with a side-arm (may or may not be used).
- Sterile gauze
- Sterile medicine glass filled with citrate solution
- Drip bulb or some other device for the control of the rate of flow of the blood
- Flask containing the blood
- Flask of normal saline

III. Unsterile equipment consisting of:
- Adhesive
- Emesis basin
- Standard
- Small rubber protector
- Dressing towel to cover the rubber
- Hot-water bottle or some form of heater to keep the blood warm while it is flowing into the vein
- Safety pins
- Restraints
- Small bowl of cold water (for rinsing needles immediately after use).

The nurse should so arrange the apparatus that the complete equipment will be within convenient reach. There will then be no reason for delay when the physician is about to start. She should use all her powers of observation to note the individual doctor's special application of the general technique. This will often insure the smooth and efficient carrying out of the whole procedure. If the physician is not the same one who has taken the blood from the donor, then a sterile gown must be provided, also a sterile brush so that he may scrub his hands. If desired, alcohol for his hands, a sterile towel, and gloves should be provided.

Meanwhile, if the site of injection has been decided upon, another nurse should place the infant in the desired position and properly restrain him.

If the median basilic vein is to be used the child is placed on his back with his arm extended, palms' side up, toward the physician. The child's body may be restrained, if necessary, by using the mummy restraint in which the child's body, with the exception of the arm to be used, is securely wrapped about with a sheet which is then firmly pinned. It is essential that the arm be held steady during the procedure so one assistant may place one hand under the elbow to prevent the flexing of the arm, and the other over the arm. Sometimes a well padded splint is used to immobilize and support the arm. After the tourniquet has been placed in position under the upper arm, and the site of injection properly prepared, the physician usually places a sterile towel over the infant's hand and forearm. Instead of using a tourniquet some prefer to firmly grasp the upper arm with their hand, thus giving the same effect as the tourniquet. When the arm is very tiny, it is rather difficult to draw the tourniquet tight enough to get the desired effect. Some physicians like to use a piece of roller bandage as a tourniquet.

The external jugular vein is also frequently used, especially in dehydrated infants when it is difficult to find suitable superficial veins. Either jugular vein may be used, but the right one is usually slightly larger and lies in a more favorable position. First, the infant's arms are restrained — here again the mummy restraint proves successful. The child is placed on his back with the head lowered over the end of the table. The nurse must turn the infant's head as far as possible to the side on which the vein is to be punctured. It is important that the nurse hold the head in this position during the entire transfusion. The ease with which the physician will be able to get into the vein and the possibility of the needle remaining there depends to a large extent on the maintenance of the proper position of the infant. The jugular vein usually becomes more prominent when the baby cries, so that the nurse may be helpful by provoking the baby to cry at the desirable time. The draping in this case usually consists of a sterile towel over the head and shoulder. This site of injection is, of course, contraindicated by the presence of infections or tumors in the region of the neck.

In some instances, no superficial veins are available and the external jugular cannot be used without being cut down upon. If the anterior fontanel is open, the superior longitudinal sinus may be easily entered and serves excellently as a site for blood injections. Again the infant is wrapped securely in a sheet. If this is done, the nurse may then devote her attention to holding the head steady. The head should rest near the end of the table, with the nurse steadying the head by holding both hands firmly over the cheeks and temporal regions. In addition to the usual preparation of the skin, the scalp over the anterior fontanel must be shaved. After this preparation the physician places a towel over the child's head. Because of the situation, particular care and skill must be exercised in puncturing this vein. It is never used in the case of skull injuries, brain hemorrhages, etc.

Blood may also be injected into the peritoneal cavity. As much as two or three hundred cubic centimeters may be given within one half hour. When given intraperitoneally, absorption takes place sometimes in less than twenty-four hours. Blood given in this way must be properly cross-matched, just as when other sites of injections are used. It is necessary that the infant be kept especially quiet during this procedure. Adequate restraint may often be brought about by the use of bath towels. First, two crib sheets are folded lengthwise in eight thicknesses. One of these is placed under the baby's back and the other under his legs. The ends are then firmly tucked under the pad on the table. A bath towel, folded in three thicknesses, is passed under the patient's back and with the arms out straight, is folded over and under each arm and securely pinned through the folded sheet. A second towel is placed under the legs, which are straight, in a like manner and pinned onto the sheet. The thighs are thus immovable and extended, and there is little danger of the child's moving. The T board may also be used as a form of restraint for infants. This board must be heavily padded with rubber. Towels are wrapped around the arms and legs of the infant and the corresponding arms and legs of the T board. Draping in this case usually consists of a sterile towel over the upper abdomen and public area.

Before intraperitoneal injection is attempted any

abdominal distention, which might be present, must be relieved. An enema, given an hour or two before the transfusion, will leave the abdomen soft and flat, so there will be no danger of puncturing the intestines. If the child is old enough, the nurse should see that he empties his bladder. In the case of infants, the feeding due at the time of the transfusion should be omitted. The chief contraindications to the above method are: Inflammation of abdominal organs, abdominal distention, and contemplated intra-abdominal operations.

The site of injection is then prepared, usually with iodine which is in turn removed with alcohol. The nurse must be sure that the sterile area she prepares is sufficiently large for the physician's requirement. For instance, when the jugular vein is used the posterior tip of the ear must also be prepared. The draping may be done by the physician or on his request by the nurse. If done by the nurse, forceps should always be used. It is important that the infant be exposed as little as possible in order to prevent his catching cold. If the child's condition warrants it, hot water bottles may be applied about his body. Meanwhile one of the nurses should hang the Salversan flask on the standard and place the end of the tubing on the sterile towel.

When the physician is ready to insert the needle, the nurse must steady the part to be used. It is well, while doing this, that she assume as comfortable a position as possible as she must hold the part steady throughout the entire procedure. Just a slight jerk is sufficient to pull the needle out of the infant's vein. The physician should be provided with a stool or chair as he must hold the needle in the same position while the entire solution runs in, and this sometimes becomes very tedious. If a syringe with a side-arm is used, the tubing of the Salversan flask is connected to this syringe, and the air is expelled from them by holding the end of the rubber tubing and the syringe above the level of solution in the flask. They are then gradually lowered until the solution flows out, expelling the air. The syringe, with the plunger inserted completely, is attached to the needle which is then inserted into the vein. By withdrawing the plunger beyond the side-arm, the solution is allowed to run into the vein. At frequent intervals the plunger may be reinserted to ascertain whether the needle is still in the vein and is still open. When the needle is first inserted, a small amount of normal saline is poured into the Salversan flask before the blood is used. Before all the saline has run in, a small amount of blood is poured into the flask. A hot-water bottle may be placed over the tubing to warm the blood as it runs through. It might be difficult to keep the blood warm if too much is poured into the flask at one time; hence the emphasis on a small amount. Usually only about twelve to twenty-four inches of hydrostatic pressure is needed to cause the blood to run into the infant's vein at the desired rate. If the child is crying vigorously, however, its venous pressure during the prolonged expiratory phase of respiration may increase to such a point that the blood will flow in the wrong direction.[10] In such instances it may be necessary to use several feet of pressure. For this reason an adjustable standard is convenient. In general, ten to fifteen cubic centimeters of blood should be given per minute. In intraperitoneal injections the blood may be given much faster without any harmful consequences.

During the transfusion a competent nurse can be of invaluable assistance to the physician. She can observe the patient's color, pulse and respiration, and keep the physician informed of them. Although we now have comparatively few reactions caused by incompatible blood the nurse must be on the lookout for a possible incompatibility. The symptoms usually occur after from fifty to one hundred cubic centimeters of blood has been given. In the event of a reaction, the transfusion must be stopped immediately and attention focused on the patient. If no such reaction occurs, however, the transfusion can be continued without interruption. The needle is removed and a sterile dressing of gauze or collodion and cotton is applied at the site of injection. This dressing should not be left on longer than 24 hours as the collection of perspiration under the dressing favors the breeding of bacteria.

The patient is now taken back to his room where he is kept warm and is closely observed by the nurse for several hours. This is essential as the infant has no way of calling the nurse should he need her. After the infant has been placed in bed, the nurse must record the following:

Pulse, temperature, and respiration before the transfusion.

Pulse and respiration during the transfusion.

Amount of saline given and time at which it was started.

Amount of blood given and time when it was finished.

Site of injection.

General condition of the patient following the transfusion.

After making this record, she devotes her attention to the important task of cleansing the equipment. All the apparatus must be separated and washed thoroughly in cold water. If this is done without delay, there will be less difficulty in removing the blood. In the list of equipment, a small bowl of cold water was mentioned. This is generally used by the physician to wash out the needles immediately after their use. The nurse should make sure all these needles are open. If they need sharpening, this should be done before they are sent to be sterilized. The syringes and flasks are usually sent to the operating room where they are again washed according to a thorough routine procedure. If only a portion of the blood has

[10]Dr. Marriott, *Infant Nutrition*, p. 204.

been used, the remainder should be carefully labeled and placed in the refrigerator. A checking of all supplies should be made and replenished if necessary. Since the cleansing of the apparatus is of extreme importance, the nurse should be consistently careful about this duty.

The force or syringe method is commonly used in transfusing infants, especially when veins are so small that they necessitate a hypodermic needle. It is impossible to get blood to run through such a needle by the gravity method. This method has also proved its superiority over the gravity method in cases where a patient's veins are starting to collapse.

The apparatus to be used in this method consists of a twenty-cubic-centimeter syringe fitted to a three- or two-way stopcock. If the three-way stopcock is used, one connection is for the patient, the other is for the blood, and the other for the saline. In the two-way stopcock, there is only a connection for the patient and for the blood. If saline is needed in the syringe it must be disconnected from the stopcock and drawn directly out of the container. Both stopcocks work out very well although there is probably a slight advantage to the three-way one.

To facilitate the use of this method it has been found helpful to equip a tray with all necessary sterile apparatus as:

20 c.c. syringe
2 needles (hypodermic needles with long bevels)
Medicine glass
Small bowl
Salversan flask, tubing, stopcock, adaptor, etc.
3-way stopcock and rubber tubing connections.
Gauze

This saves the trouble of gathering this material together when it is to be used and also makes the sterilizing problem easier.

The procedure in this method is much the same as in the gravity method. The same unsterile equipment is collected as well as the blood and normal saline which are immersed in the pans of water at room temperature. The contents of the above-mentioned tray are laid out on a sterile field. The Salversan flask is hung up on the standard, and the sterile adaptor is placed on the sterile towel. The small pan is filled with sterile mineral oil which might sometimes be needed if the syringe is not working smoothly. The physician or nurse then connects the 20 c.c. syringe to the stopcock. The tubings which go to the pan of saline, Salversan flask, and needle are in turn connected to this stopcock.

When the physician is ready to insert the needle, the nurse draws about ten cubic centimeters of normal saline into the syringe by turning the stopcock toward the tubing leading to it. Then the physician inserts the needle. Because of the size of the vein it is not possible to withdraw blood. To make sure, therefore, that one is in the vein, a small amount of saline is injected. If the needle is not in the vein, a lump will appear at the site of injection. The physician then knows he must make another puncture further down. When he is sure the needle is in the vein, the blood is pumped in by first turning the stopcock toward the flask containing the blood and drawing the blood into the syringe; then by turning the stopcock in the direction of the patient and forcing the syringe full of blood into the vein. This procedure is repeated until the desired amount of blood is given. The amount is measured by the number of syringe-fulls injected. The nurse is generally assigned the task of keeping count of the amount of blood given. Obviously if the gravity method is attempted where tiny veins are involved, the blood would not run in for several hours. This method would not be at all practical.

During this procedure it is necessary that aseptic technique be carried out. Both the nurse and the physician must see that their hands are clean before touching any of the sterile material. Great care must be taken to hold the needle securely in place during manipulations of the syringe. The nurse should try to make these manipulations with as little moving of the needle as possible. If the syringe becomes too difficult to work, the plunger may be dipped into the sterile mineral oil.

The care of the patient during the transfusion and following it is the same as previously described under the gravity method. The care of the material however is somewhat different. The apparatus must be thoroughly cleansed. Then it is placed on the tray and covered with a small towel. The entire tray is then wrapped in a strong cover and is sent to the operating room to be autoclaved. Here again it might be emphasized that the nurse should be aware of her responsibility with regard to the cleansing of the equipment as it will not be submitted to a second washing in the operating room.

Transfusion Reactions

With reactions that might result as a consequence of transfusions, there is a great variation in their type and degree. It may vary from a slight elevation to one of 105 degrees Fahrenheit with such symptoms as nausea, vomiting, pains in various parts of the body, and skin eruptions. All post-transfusion chills are said to be avoidable, and therefore every precaution should be taken in their prevention. It is interesting to note an article appearing in the September, 1938, issue of *Surgery, Gynecology and Obstetrics*, by Drs. William Sibley and John Lundy, in which they report on whether the benefits derived from blood transfusions are lessened when a reaction occurs. The following is quoted from the summary appearing at the end of the article. There was definitely less increase in the value for hemoglobin of the recipient, as a rule, when a reaction to transfusions occurred than when a reaction did not occur. In the average case, there was but 50 per cent as much of an increase in the value for hemoglobin, after transfusion of five

hundred cubic centimeters when a reaction occurred than there was when a reaction did not occur.[11] If this is true then the prevention of such reactions is certainly of extreme importance.

Some of the most frequent causes of transfusion reactions are: Incompatible blood, break in aseptic technique, improper cleaning and sterilization of apparatus, impure citrate solution, fungous growth in the distilled water used, too rapid administration of blood to the recipient. Some of these are the responsibility of the floor nurse, others belong to the operating room, others again to the laboratory.

As was mentioned previously, reactions caused by the administration of incompatible blood usually manifest themselves after from fifty to one hundred cubic centimeters of blood have been given. Some of the most important symptoms of such reactions are: Restlessness, tingling pain over the entire body, fullness in the head, dyspnea, precordial oppression, flushing of the face, nausea, vomiting, marked changes in heart rate, violent backache. The patient may finally become cyanotic, and syncope may occur with the pulse becoming weak and rapid and the skin cold and clammy. Because of the patient's age, the nurse will have to be especially keen in her observation in order to detect any sign which may be indicative of a reaction, because obviously the infant is incapable of telling her of such symptoms. The face, carotid pulsation, and fingernails may be observed for cyanosis which is an early indication of transfusion reaction. Loss of pulse volume is another early indication that should not be overlooked by the nurse. For this reason, the pulse should be checked before the transfusion and frequently during the transfusion.

At any of the above symptoms, the transfusion should be stopped immediately. If the patient is in a state of collapse, local heat and sometimes adrenalin solution 1:1000, minims ten subcutaneously, should be administered. Later symptoms which sometimes occur are: Chills followed by a high fever, an urticarial eruption, a hemoglobinuria and suppression of the urine. Jaundice may develop and the patient usually shows an increased anemia. If oliguria continues, drowsiness may set in, and the patient may die of uremia.[12] Such severe cases as these are, however, rare.

Reactions may also be caused by the presence of foreign substances in the apparatus due to faulty cleaning. If the apparatus is not cleansed thoroughly following each transfusion, minute blood clots and other foreign matter might remain in it, and cause a chill in the next case. This is one of the main reasons why hospitals continually insist that the nurse, responsible for cleansing transfusion apparatus, should observe all precautions that will insure asepsis. Some hospitals have found a reduction in the number of post-transfusion reactions when there is a central place for the cleansing and sterilizing of all such apparatus.

Other factors influencing reactions are the rate of infusion of the blood into the recipient. Citrated blood is the only kind that admits a possible slow rate of infusion. The first one hundred cubic centimeters especially should be given very slowly to test the tolerance of the recipient clinically. It is not correct to say that infants who are very ill are more likely to suffer post-transfusion reactions, because the majority of reactions occur in infants who are not critically ill. It is thought, however, that the reaction depends to some extent upon the ability of the body to respond to the introduction of a foreign substance, as, the presence of fungous growth in supposedly sterile distilled water which has stood for several days. This distilled water might be used in the preparation of normal saline which is then used in the method of transfusing. Accordingly, we see how important it is that great care be exercised in the preparation and sterilization of all solutions used, either directly or indirectly in transfusions.

The nurse should be prepared in the event of a reaction to give immediate, and efficient treatment. Heat, in the form of hot-water bottles and blankets, is considered to be the ordinary therapeutic agent. The temperature, pulse, and respiration should be taken frequently. In case of severe chill the child must be watched carefully so that he may not harm himself in any way. It may be necessary to place something in the child's mouth to prevent his biting his tongue or lip. If hot-water bottles are used, their position must be changed frequently lest they harm the infant. Hot-water bottles placed on the top of the blanket will be less apt to injure the infant's tender skin. No nurse should ever omit to inform immediately, the intern or house physician of an occurring reaction. The time of the onset, the symptoms, the temperature, the pulse, the respiration, and the duration of the reaction should be conscientiously charted. The majority of hospitals keep record of all reactions and check them carefully in an effort to find and remove their cause.

Other Methods of Administration

Blood is given in other forms than citrate. Frequently, in the case of hemorrhagic diseases of the newborn whole blood injections are used. It is sometimes used to prevent bleeding in intercranial injuries following operative deliveries. Due to the fact that it takes 20 to 24 hours to absorb when given intramuscularly no tests for hemolysis and agglutination are necessary.

The fact that blood given in this way favors clotting makes it more valuable in the treatment of hemorrhagic diseases. It is not known exactly how this result is accomplished, but it is thought that probably

---

[11]Dr. William Sibley and John Lundy, "The Behavior of the Hemoglobin after Blood Transfusion," *Surgery, Gynecology and Obstetrics*, (September, 1938), pp. 293-98.

[12]Lemmer, Kenneth, M.D., "Blood Transfusion," *The American Journal of Nursing* (April, 1938), p. 405.

absorption from the blood products in the body "steps up" thromboplastin. However, the same value of the red cells is not obtained, as these cells are not absorbed until they have been broken down.

Maternal or paternal blood is most commonly used, but any person who has blood of normal constituents or noninfected blood may serve as a donor. Frequently if the mother's condition is satisfactory the blood is taken from her and immediately given to the infant. In the case of hemorrhagic disease intramuscular injections of blood may be repeated in twelve to 24 hours if necessary. Twenty to thirty cubic centimeters is given each time.

The sites used most frequently for injections are: between the flexor and extensor muscles of the thigh, in the gluteus maximus, and in the latissimus dorsi. The first site mentioned has the advantage of being located where there is little danger of the dressing becoming soiled from meconium and urine. If the latissimus dorsi is used as the site, care must be taken not to insert the needle into the pleural cavity.

The equipment necessary for this procedure is:

Small bottle of alcohol
Enamel jar with cotton balls
Sterile gauze
Tourniquet
Small piece of rubber protector
Dressing towel to cover the rubber
20 or 30 c.c. syringe (sterile)
2 needles 1½ in. long, 18 or 20 gauge
Emesis basin
Adhesive

The method of procedure is very simple. All the material is assembled at the donor's side. The rubber sheet, covered with the towel, is placed under the donor's arm. The tourniquet is applied around the upper arm. The skin is cleansed with alcohol. The physician then inserts the needle, which is attached to the syringe, into the vein and the tourniquet is loosened. The vein used is the median basilic. About twenty or thirty cubic centimeters of blood are withdrawn into the syringe. The needle is then changed quickly, and the blood is injected slowly, deep into the muscles of the baby, the area having been cleansed with alcohol. When the needles have been withdrawn from both the donor and the baby, the areas are cleansed again with alcohol, and a small dry dressing is applied which is kept in place with adhesive. These dressings may be removed in from 20 to 24 hours.

Immediately after the injection of the blood and the application of the dressing, the syringe and needles should be washed and cleansed, and all the equipment should be put in its proper place. Then suitable notations should be made on the chart. The nurse should observe the infant closely to see if the injection is having the desired effect. Sometimes after just one injection of blood the hemorrhage is controlled.

This procedure does not demand a great deal of nursing care. This care consists chiefly in the preparation of the equipment, preparation of the recipient and donor, assisting the doctor, and keeping the dressing on the infant dry and in place.

Serum Transfusions

Blood may also be given in the form of blood serum which is the blood minus the fibrin and cells. In cases of hemophilia neonatorum its use has proved quite successful. The etiology of the hemorrhage is usually not known. The bleeding occurs, as a rule, during the first week of life. Primary bleeding may be from anywhere in the skin or mucous membrane surfaces, in the brain or liver or in any of the internal organs. The first sign of bleeding might be a slight oozing from the cord which is not due to faulty tying. This bleeding may persist in spite of local remedies, and as a result a considerable amount of blood may be lost. Other bleeding may come from the gastro-intestinal tract. The mortality in these cases was very high before the use of blood. Such therapeutic measures as calcium salts, and solutions of gelatin or adrenalin seemed to have very little effect in controlling these hemorrhages.

Sometimes the hemorrhage is due to a bacteremia caused by the streptococcus, staphylococcus, and in some cases a bacillus. It has been demonstrated so frequently that it is now a matter of common knowledge that fresh normal human blood serum is often bactericidal. If put into the body of a baby, having bacteremia from the above causes, in sufficient quantities, and kept moving by the circulation to elimination, it must surely exert this bactericidal effect.[18] Blood serum serves as a perfect form of food. It is already digested and ready to be utilized by the cells and tissues of the body. In many of the above cases, due to the bleeding from the gastro-intestinal tract, another source of nourishment must be found. The food is not prepared properly for absorption and also the circulation is usually too feeble to remove it into the tissues. Serum when placed under the skin is quite readily absorbed from the site of injection. The average amount of serum given as an initial dose is ten cubic centimeters. This may be repeated three times a day if the infant is bleeding moderately. In severe cases it may be given every two hours in larger quantities. This treatment should be started at the first sign of hemorrhage because sometimes apparently insignificant bleeding may be accompanied by fatal internal bleeding.

Blood serum is also sometimes used in the treatment of sepsis in the new born. The serum has the valuable effect of activating the complement content of the patient's blood, which in the case of severe infections is usually low. This complement is necessary for what is called the complement immunity against infections. Whenever it is necessary to build up an immunity in the patient against some infection and the

[18]John Welch, "Normal Human Blood Serum as a Curative Agent in Hemophilia Neonatorum," *American Journal of the Medical Sciences* (March, 1910), p. 813.

red blood count and hemoglobin are sufficiently high, the serum is all that is necessary because it is in it that the complement is contained. Also, where serum is used instead of whole blood this complement titer remains higher without the subsequent tendency to drop, and each serum transfusion seems completely to reactivate the patient's serum.[14]

Blood serum is collected very easily. It is not necessary to type the donor when the serum is to be given intramuscularly. About five hundred cubic centimeters of blood is drawn from the donor, in the usual manner, into a wide-mouthed flask. The blood is allowed to coagulate in a slanting position in this flask. After several hours, due to the fact that no citrate has been added, the serum separates from the cells and fibrin. The serum may be withdrawn and used as quickly as it separates. When withdrawing the serum care must be taken not to disturb the clot. One nurse should gently tilt the flask while another one draws off the desired amount of serum in a syringe to which a needle is attached. The flask is then properly labeled and placed in the refrigerator until used for subsequent doses.

Blood serum is injected in the same manner and in the same sites as is the whole blood. It is absorbed a great deal faster than the whole blood and for this reason is less likely to produce an infection at the site of injection. Blood serum never gives evidence of producing serum sickness or causing anaphylaxis in the human subject.

Practically the same requisites and nursing care is needed in serum injections as in whole-blood injections. It is the duty of the nurse to observe when enough serum has settled off to be used. She must also remove the serum into the syringe and have it ready for the physician to inject. After properly preparing the site of injection with alcohol, it is necessary that she hold the infant firmly so that he will not move when the needle is inserted. A gentle massaging of the site of injection will speed the rate of absorption. Here again it is important that the nurse observe the infant closely to see if the medication has the desired effect. It is principally on these observations that the physician gauges his amount and frequency of doses, especially in the case of hemorrhage. The nurse should make accurate notations on the chart.

If frequent injections are to be necessary, the nurse should see that a sufficient amount of serum is kept on hand. She must make sure that the blood is taken in ample time for the serum to separate out before it will be required for use. The physician expects the nurse to see to this, so that no delay is necessary.

In connection with this subject, it is interesting to note the use one particular hospital makes of blood serum. An account of the prophylactic use of parental blood serum against contagion in a pediatric ward appeared in the 1936 February issue of *The American Journal of Diseases of Children,* written by Drs. L. Barenberg and David Greene.[15] This experiment was carried out at the Morrisan City Hospital in New York City.

On admission to the children's medical ward of the hospital, after the history had been taken, the parent was taken to the treatment room where from sixty to 75 cubic centimeters of blood was taken. A small amount of this blood was sent to the laboratory where a Kahn test was run. The remainder was stored in the refrigerator at forty degrees Centigrade. If the Kahn test was negative, the child received an intramuscular injection of from twenty to thirty cubic centimeters of the parental blood serum. If the Kahn was positive or if the child was an orphan, blood serum was used from a stock amount which the hospital kept on hand.

The children admitted to the surgical ward were not given the serum but were used as a control group. The medical ward was used for the experiment as it was believed that it presented more opportunities for the outbreak of contagious diseases.

During the first four years of the experiment, which covered seven years altogether, no parental blood was given to any of the children. During this period there were thirteen outbreaks of contagion in the medical ward and thirteen in the surgical ward. Results which were obtained at the end of the seven years showed that during the last three years, when the parental serum was employed as a prophylactic agent, no outbreaks of contagion occurred in the medical ward; while 12 occurred in the surgical ward. It was also discovered that one injection of blood serum conferred immunity for only a short time, so that if a child remained in the ward for more than two weeks it was necessary to repeat the injection.

Contraindications

Mention must be made regarding contraindications to blood transfusions although many think it questionable whether there are any contraindications or not. Some consider any circulatory disturbance such as myocardial failure to be a contraindication. They believe that it is possible to overburden a weakened circulatory apparatus by increasing the blood volume. However, the volume of circulating fluid rapidly becomes adjusted to compensate for any addition or decrease. Following a hemorrhage, the increased blood volume which results from the transfusion aids in replenishing the fluid which has been drawn from the tissues. If the blood volume is normal and more fluid is added, in the form of a transfusion, the excess is usually rapidly excreted by the kidneys or lost to the tissues. If the heart is failing from myocardial weakness, the introduction

[14]Hollis Allen, M.D., "Modern Advances in the Treatment of Sepsis," *The Journal of the Missouri State Medical Association* (Feb., 1938), p. 36.

[15]L. H. Barenberg and David Greene, "The Prophylactic Use of Parental Blood Serum Against Contagion in a Pediatric Ward," *The American Journal of Diseases of Children* (Feb., 1936), pp. 326–29.

of new blood acts as a stimulant to the heart muscle, so an unneeded increase in blood volume is promptly disposed. It is thus doubtful if any circulatory disturbance, as myocardial failure is a contraindication to a needed transfusion.[16]

Others have thought that a transfusion might cause bleeding to continue or initiate it again after an acute hemorrhage. In these cases it is thought, by the majority, that the value of transfusion usually far outweighs any chance of harm.

In an article written by Dr. Ives and read before the St. Louis Medical Society, April 26, 1927, he states that according to Bernheim the following are considered dangerous risks for a transfusion:

1. Patients who have been so completely exsanguinated as to be in such extreme shock that the additional hazard of a citrate transfusion must be avoided.
2. Patients in such profound states of anemia as to be almost dead.[17]

Dr. Ives then goes on to say that according to this doctrine transfusions cannot be given to those patients who are most in need of them. He also points out the difficulty that would be involved in trying to decide just whether a patient is strong enough for a transfusion and when a patient is too weak to be able to stand a transfusion. Dr. Ives states that his own experience includes numerous transfusions to patients most extremely ill from acute hemorrhage, chronic anemia, shock, etc., with very satisfactory results.

According to the majority of physicians, the contraindications to transfusions are very slight. If there is a case where there might be a chance of overloading the circulatory system, a transfusion can be given very slowly by the citrate method or even by the drip method. In considering the advisability of any transfusion the hazards should be weighed against the benefits which may be expected. Transfusion should always be considered a serious matter and should not be carried out for trivial complaints and minor ailments.

[16]Russell Haden, "Indications For and Contraindications to Blood Transfusions," *The Surgical Clinics of North America* (Oct., 1937), p. 1511.

[17]George Ives, "Blood Transfusions," *The Journal of the Missouri State Medical Association* (July, 1927), p. 287.

Bibliography

Kimber, Diana, Carolyn Gray, and Caroline Stackpole, *Textbook of Anatomy and Physiology* (New York: Macmillan Co., 1934).

Maximow, Alexander, and William Bloom, *A Textbook of Histology* (Philadelphia and London: W. B. Saunders Co., 1930).

Hertzler, Arthur, and Victor Chesky, *Minor Surgery* (St. Louis: C. V. Mosby Co.).

Zahorsky, John, *Pediatric Nursing* (St. Louis: C. V. Mosby Co.).

Kerley, Charles Gilmore, *Practice of Pediatrics* (Philadelphia and London: W. B. Saunders Co., 1914).

Bancroft, Corinne, Elizabeth Pierce, and Bessie Cutler, *Pediatric Nursing* (New York: Macmillan Co., 1938).

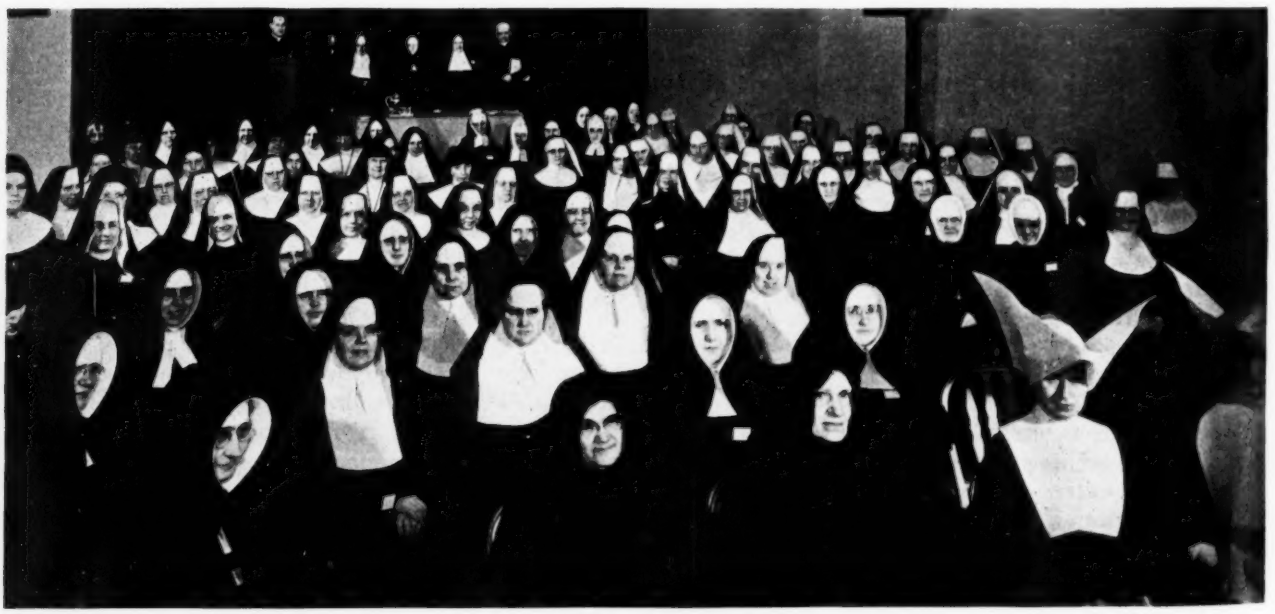
Marriott, William McKim, *Infant Nutrition* (St. Louis: C. V. Mosby Co., 1935).

Haden, Russell, "Indications for and Contraindications to Blood Transfusions," *The Surgical Clinics of North America* (Oct., 1937), 1511–1515.

Allen, Hollis, "Modern Advances in the Treatment of Sepsis," *The Journal of the Missouri State Medical Association* (Feb., 1938), 35–37.

Ives, George, "Blood Transfusions," *The Journal of the Missouri State Medical Association* (July, 1927), 285–89.

DeBakey, Michael, and Edith Honold, "Blood Transfusion," *International Medical Digest* (Nov., 1937), 301–313.



NINETEENTH ANNUAL CONVENTION, ILLINOIS CONFERENCE, CATHOLIC HOSPITAL ASSOCIATION, PALMER HOUSE, CHICAGO, ILLINOIS, FEBRUARY 20, 1941. AT SPEAKERS' PLATFORM (LEFT TO RIGHT): REV. JOHN W. BARRETT, DIOCESAN DIRECTOR OF HOSPITALS, CHICAGO; SISTER M. VERONICA, R.N., PAST PRESIDENT, ILLINOIS CONFERENCE; SISTER M. CORNELIA, R.N., TREASURER, ILLINOIS CONFERENCE; SISTER HELEN JARRELL, R.N., PRESIDENT, ILLINOIS CONFERENCE; REV. ALPHONSE M. SCHWITALLA, S.J., PRESIDENT, C.H.A.

Sibley, William, and John S. Lundy, "The Behavior of the Hemoglobin after Blood Transfusion," *Surgery, Gynecology and Obstetrics* (Sept., 1938), 293–98.
Lewishon, Richard, "Prevention of Chills Following Transfusion of Citrated Blood," *Journal American Medical Association* (Feb., 1933), 466–68.
Barenberg, L. H., M. J. Grand and David Greene, "The prophylactic Use of Parental Blood Serum Against Contagion in a Pediatric Ward," *The American Journal of Diseases of Children* (Feb., 1936), 326–29.
Lemmer, Kenneth, "Blood Transfusion," *The American Journal of Nursing* (April, 1938), 403–7.
Heimann, Lucille, "The Nurse in Blood Transfusion," *The American Journal of Nursing* (April, 1938), 408–13.
Interview with Dr. Hollis Allen.
Interview with Dr. J. P. Costello.

Pennsylvania

Join Medical Mission Sisters. At profession and reception ceremonies at the motherhouse of the Medical Sisters in Philadelphia, five novices made their first vows and one postulant received the habit.

The Medical Mission Sisters are a religious community devoted to the care of the sick in foreign missions. At present the work of the Sisters is entirely in India, where they have four missions.

A number of the Sisters are doctors; others are nurses, pharmacists, technicians, students.

Capping Ceremonies. On Sunday evening, March 2, a very impressive but informal ceremony took place at the nurses' home of St. Joseph's Hospital in Pittsburgh, when 16 young ladies, including a Sister, were capped after having completed their six months' preclinical course.

The speaker of the evening emphasized the necessity of a Catholic nurse's acting according to the principles of Faith in her ministrations to suffering humanity.

A pageant followed, portraying the virtues of Faith, Hope, and Charity, so necessary in the nurse of today.

The music of the evening was rendered by members of the St. Canice School band.

An informal reception and luncheon for the students and their guests concluded the ceremony.

OUR AUTHORS

SISTER CARMEN MARIE SWIFT, O.S.F., R.N., B.S., Mt. St. Clare Convent, Clinton, Iowa. *An Isolation Unit in a General Hospital of Seventy-five Beds.*

ROBERTA CATHERINE BEAL, R.N., B.S., St. John's Hospital, St. Louis, Mo. *Specific Nursing Measures Apposite to Blood Transfusions in Infants.*

HOSPITAL PROGRESS

A JOURNAL *of* HOSPITAL SCIENCE *and* NURSING EDUCATION

Established in 1920 as the Official Journal of the Catholic Hospital Association of the United States and Canada, ST. LOUIS, MO., U. S. A.

Published with Ecclesiastical Authorization

EDITORIAL BOARD

ALPHONSE M. SCHWITALLA, S.J.
Editor-in-Chief

Hospital Administration

REV. MOTHER M. ROSE CURRAN, R.N., M.A.,
Sisters of Mercy,
St. Mary's Convent,
Pittsburgh, Pennsylvania

SISTER KENNY, R.N., A.B.,
Religious Hospitallers of St. Joseph,
Hotel Dieu — St. Joseph,
Chatham, New Brunswick

Nursing Service

SISTER MARIE CHARLES, R.N.,
Sisters of Charity of St. Vincent de Paul,
St. Mary's Hospital,
Brooklyn, New York

SISTER M. GREGORY, S.S.A., R.N., B.S.,
Sisters of St. Ann,
St. Joseph's Hospital,
Victoria, British Columbia

Nursing Education

SISTER M. DOMITILLA, R.N., M.A.,
Franciscan Sisters of Our Lady of Lourdes,
St. Mary's Hospital,
Rochester, Minnesota

SISTER ST. ALBERT, R.N.,
Sisters of St. Joseph,
St. Michael's School of Nursing,
Toronto, Ontario, Canada

Canada

MOTHER M. ALLAIRE,
Grey Nuns of Montreal,
Grey Nunnery,
Montreal, Quebec

Religious Activities

THE REVEREND JOHN W. BARRETT,
Diocesan Director of Catholic Hospitals of the Archdiocese of Chicago,
Chicago, Illinois

Public Relations

THE REVEREND JOHN J. BINGHAM,
Assistant Director, Division of Health,
Catholic Charities of the Archdiocese of New York,
New York City, New York

Social Service

THE RIGHT REVEREND MONSIGNOR THOMAS J. O'DWYER,
Catholic Charities of Los Angeles and San Diego,
Los Angeles, California

Medicine

RALPH KINSELLA, M.D.,
St. Louis University School of Medicine,
St. Louis, Missouri

Out-Patient and Allied Services

GORONWY O. BROUN, M.D.,
Firmin Desloge Out-Patient Service,
St. Louis, Missouri

Publisher

WILLIAM C. BRUCE,
The Bruce Publishing Company,
Milwaukee, Wisconsin

Assistant to the Editor-in-Chief — M. R. KNEIFL

NEW BOOKS

Bedding Manual for Professionals. Purchase, Use, and Care of Mattresses, Springs, Pillows, Sheets, Blankets, Pads, and Spreads. Buyers' Dictionary of 250 Terms. Pictorial Step-by-step Instructions for Bedmaking. Forty telling illustrations. By Crete M. Dahl, M.S. 143 pp. Price, $1. This is the one hundred and fourth volume on business and hospitality subjects published by The Dahls, Stamford, Conn., 1940.

The Catholic Nurse in Action. By Mary Ellen Evans, M.A. Pamphlet. Price, 5 cents (Dubuque, Iowa: The Nurses' Apostolate, St. Joseph Mercy Hospital, 1940).

Communicable Diseases. By Nina D. Gage, A.B., M.A., R.N., and John Fitch Landon, A.B., M.D. With the Collaboration of Grace M. Longhurst, R.N., and George F. Hoch-A.B., M.D. Second Edition. 411 pp. 40 Illustrations Including 11 Color Plates. Price, $3.50 (Philadelphia: F. A. Davis Company, 1940).

Convert Instruction Card No. 16, "Why Catholics Attend Mass." Price, 1 cent per card — 25 cents per set (unbound) (St. Paul, Minnesota: Rumble & Carty — Radio Replies, 1940).

Emotional Hygiene, The Art of Understanding. By Camilla M. Anderson, A.B., M.D. Cartoons by Dorothy G. Stevenson. Second Edition Revised. 253 pp. Price, $2 (Philadelphia, London, New York, Montreal, Chicago: J. B. Lippincott Company, 1940).

Footprints of the Trojan Horse. Some Methods Used by Foreign Agents within the United States. Illustrations by Jack Betts. Published by Citizenship Educational Service, Inc., 122 East 42nd Street, New York City, 1940.

Fundamentals of Administration for Schools of Nursing. Report of the Committee to Study Administration in Schools of Nursing, 270 pp. (New York: National League of Nursing Education, 1940).

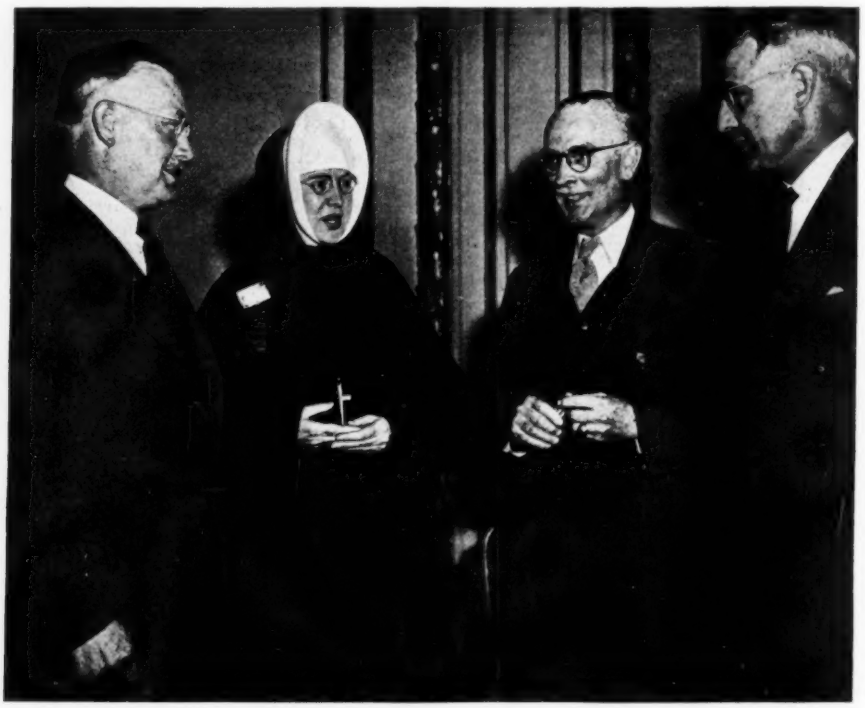
Hotel Engineering. Part 1 — Water Consumption, Costs and Savings. Prepared under the supervision of the Research Department of the American Hotel Association. By Georges C. St. Laurent, B.S. First of five books to be published on the various phases of hotel engineering problems and economies. 32 pp. Price, $1 (New York: American Hotel Association, 221 West 57th Street, 1940).

Hotel Housekeeping Standards and Employee Schedules. Ethel C. Schneider. 109 pp. Price, $1 (Stamford, Connecticut: The Dahls, 1940).

Religious Correspondence Course. By Aloysius J. Heeg, S.J. The New Leaflet Edition of "Jesus and I" with Directions, Text, Pictures, Games, Exercises, and Questions. Also for Classes of the Confraternity of Christian Doctrine. Price, 50 cents for one entire set; $1 for three; $7.50 for twenty-five; $25 for one hundred; $200 for one thousand (St. Louis, Missouri: The Queen's Work, 1940).

Knight of Christ. Ignatian Meditation Series II. By J. E. Moffatt, S.J. 221 pp. Price, $1.75 (Milwaukee: The Bruce Publishing Company, 1940).

Manual of Specifications for the Purchase of Hospital Supplies and Equipment. Prepared by the Committee on Simplification and Standardization of Hospital Furnishings, Supplies and Equipment of the Council on Hospital Planning and Plant Operation of the American Hospital Association. Bulletin No. 208. 734 pp. Published by the American Hospital



THEME — HOSPITAL PREPAREDNESS IN A DEMOCRACY, WESTERN CONFERENCE, CATHOLIC HOSPITAL ASSOCIATION, SAN FRANCISCO, CALIF., MARCH 3, 1941. LEFT TO RIGHT: BENJAMIN W. BLACK, M.D., DIRECTOR, ALAMEDA COUNTY INSTITUTIONS; SISTER ELIZABETH CLARE, R.N., PRESIDENT, WESTERN CONFERENCE, CATHOLIC HOSPITAL ASSOCIATION; LIEUTENANT COLONEL CORBY, M.D., CHIEF MEDICAL DIVISION, 91ST CORPS ARMY AREA; L. R. CHANDLER, M.D., DEAN, STANFORD UNIVERSITY MEDICAL SCHOOL.

Association, 18 East Division Street, Chicago, Ill., 1940.

Minutes that Matter. 15 pp. Published by The Patterson Screen Company in the Interests of Better Radiography. Towanda, Pa., 1940.

Night Nursing. By Catherine E. Reilly, R.N. 156 pp. Price, $2 (Philadelphia: F. A. Davis Company, 1940).

Obstetric Management and Nursing. By Henry L. Woodward, M.D., and Bernice Gardner, R.N. With a Section on Home Deliveries by William P. Gillespie, M.D. Also with a Section on Diseases of the Newly Born by Harold F. Downing, M.D. Second Edition. 752 pp. 358 Illustrations. Price, $3.50 (Philadelphia: F. A. Davis Company, 1940).

Plague on Us. By Geddes Smith. 365 pp. Price, $3 (New York: The Commonwealth Fund, 1941).

Prayers for the Holy Hour. Compiled and arranged by Rev. James J. Graham, M.A. 93 pp. Price, 25 cents (Milwaukee: The Bruce Publishing Company, 1940).

Professional Adjustments II. By Lena Dixon Dietz, R.N. 420 pp. Price, $2.50 (Philadelphia: F. A. Davis Company, 1940).

Professional Adjustments Notebook for First-Year Students of Nursing. By Elizabeth M. Jamieson, B.A., R.N., and Mary Sewall, B.S., R.N. (Philadelphia: J. B. Lippincott Company, 1940.) Price, $1.25.

The Red Rose of Suffering. Wanted: Co-Missionaries. By The Reverend Bruno Hagspiel, S.V.D. 68 pp. Price, 10 cents (Techny, Illinois: The Mission Press, 1940).

Reflections on the Rosary for Nursing Sisters. By Dominican Sisters. 126 pp. (Great Bend, Kansas: Congregation of the Immaculate Conception, 1940).

Smoke-Screen. By Samuel B. Pettengill. 126 pp. Published by America's Future, Inc., 205 East 42nd Street, New York, N. Y., 1940.

Speaking of Catholic Action. A Tribute to the Nurses' Apostolate. By The Reverend John T. McGinn, C.S.P. Pamphlet. Price, 5 cents (Dubuque, Iowa: The Nurses' Apostolate, St. Joseph Mercy Hospital, 1940).

Stepping Stones to Sanctity. Gleanings from the Spiritual Direction and Teachings of Rev. Paul R. Conniff, S.J. By Rosalie Marie Levy. 117 pp. Price, $1. Published by Rosalie Marie Levy, P.O. Box 158, Station O, New York, N. Y., 1940.

Surgical Nursing. By Robert K. Felter, M.D., and Frances West, R.N. Second Edition. 553 pp. With 172 Illustrations and 6 Color Plates. Price, $3.50 (Philadelphia: F. A. Davis Company, 1940).

Taber's Cyclopedic Medical Dictionary Including a Digest of Medical Subjects: Medicine, Surgery, Nursing Dietetics, Physical Therapy. By Clarence Wilbur Taber and 14 Associates. 1488 pages with 273 illustrations. Cloth, Thumb-indexed, $3; Plain, $2.50 (Philadelphia: F. A. Davis Company, 1940).

PERSONAL NEWS ITEMS

Colorado

Superior Is Transferred. Sister Alexandrine, for the past six years superior of Mt. San Rafael Hospital, Trinidad, has assumed newly appointed duties at the Good Samaritan hospital in Dayton, Ohio. Succeeding Sister Alexandrine at the Trinidad institution is Sister Leonilla, who was formerly attached to the San Rafael staff.

Connecticut

Death Overtakes Staff Member. Dr. Richard A. Outerson, member of the staff of St. Francis Hospital in Hartford, died early in February, and his death was a loss out of the ordinary. It was said of him that he gave his patients a degree and quality of service limited only by the measure of his physical powers. And it was his diffusive good nature which gave him an importance to the hospital above and beyond that of his professional excellence. The sight of Dr. Outerson's smiling face, the sound of his heartening voice, the hearing of one of his vividly enacted stories, refreshed any of his colleagues bowed under the burden of the difficulty of the moment.

Head of Staff Named. Dr. James F. Rooney was named head of the St. Francis Hospital staff in Hartford. Dr. Rooney has been a member of the St. Francis staff for about 25 years, and a practicing physician and surgeon in Hartford since 1907.

Illinois

Officers Elected. At the February meeting of the Illinois Conference of the Catholic Hospital Association, the following officers were elected for the coming year: Sister Helen Jarrell, St. Bernard's Hospital, Chicago, president; Sister M. Ancilla, St. Francis Hospital, Peoria, vice-president; Sister M. Bede, St. Charles Hospital in Aurora, secretary; Sister M. Cornelia, St. Elizabeth's Hospital in Chicago, treasurer. Executive committee: Sisters M. Veronica, Mercy Hospital, Chicago; M. Kunigunde, St. Andrew's Hospital, Murphysboro; M. Ferdinand, St. Mary's Hospital, Quincy.

Kansas

1941 Staff Officers. Dr. J. J. Hovorka is president of the staff at St. Mary's Hospital in Emporia. Dr. D. P. Trimble is vice-president, and Dr. F. J. Eckdall, secretary and treasurer. The medical library committee is composed of Dr. F. Foncannon, chairman; Dr. C. C. Underwood; and Dr. T. P. Butcher.

Kentucky

Change in Superior. Sister Lucovica, of Lexington, is the new superior of SS. Mary and Elizabeth Hospital in Louisville. She succeeds Sister Mary Albert, who is now in charge of the new Ensley Hospital, which the Sisters of Charity of Nazareth have taken over.

Michigan

Successes of Missionary Sister. Sister Margaret Mary (Van Agtmael), a graduate of St. Lawrence Hospital in Lansing, was recently appointed a member of the examining body of the Punjab Trained Nurses Association. Sister Margaret Mary has been in India for a number of years and has devoted herself especially to the training of Indian lay nurses and Indian Sisters. She has been particularly successful in this work in spite of many difficulties, one of them being that the subject matter has to be imparted in the native language.

Recently, a group of her students — Indian Sisters belonging to the Associates of Mary, a native community founded by the Holy Cross Sisters — passed their government exami-

OFFICERS AT THE MEETING OF THE CHAPLAINS' SECTION, WESTERN CONFERENCE, CATHOLIC HOSPITAL ASSOCIATION, SAN FRANCISCO, CALIF., MARCH 3, 1941. LEFT TO RIGHT: THE REVEREND JOSEPH M. CLARK, S.J., CHAPLAIN, SAN FRANCISCO COUNTY HOSPITAL, VICE-CHAIRMAN; THE REVEREND CHARLES KNEBEL, O.F.M., CHAPLAIN, QUEEN OF ANGELS HOSPITAL, LOS ANGELES, CHAIRMAN; THE REVEREND JOHN J. BUNYAN, CHAPLAIN, ST. MARY'S HOSPITAL, SAN FRANCISCO.

nations in nursing as well as in midwifery. One of the Sisters took first place among 69 candidates.

Sister Margaret Mary is a member of the Society of Catholic Medical Missionaries whose Motherhouse is in Fox Chase, Philadelphia, Pa.

North Dakota

New Director Appointed. Sister Giovanni, O.S.B., has been appointed director of nurses at the St. Alexius Hospital School of Nursing in Bismarck. She is a recent graduate of St. Mary's Hospital, St. Louis, Mo.

Ohio

Honor Monsignor Griffin. A portrait of Rt. Rev. Msgr. Maurice F. Griffin, a trustee of the American Hospital Association for 20 years, was unveiled in the library of the headquarters of the Association in Chicago recently. The portrait, the first of one of its members to be presented to the Association, was donated anonymously, and is in the nature of a tribute to the Monsignor's labors in advancing the standards of hospitals in this country.

Monsignor Griffin is also vice-president of the Catholic Hospital Association and treasurer of the Ohio Hospital Association. He is one of the founders of St. Elizabeth's Hospital, Youngstown, and was also an early supporter of the hospital service plans which now have spread throughout the nation.

Marks 60 Years in Religion. Sister Mary Germaine McGinty of the Religious Sisters of Mercy, celebrated the 60th anniversary of her religious profession on February 5, at Mercy Hospital in Hamilton. In spite of her years, Sister Germaine is able to attend all community exercises, and performs her assigned duty in the sewing room.

Pennsylvania

Death Takes Superintendent. Mother M. Edmonda, superintendent of the Fitzgerald-Mercy Hospital in Darby, died on February 18, after a brief illness.

Wisconsin

Hospital Superior Succumbs. Sister Calista, Sister superior of Sacred Heart Hospital, Eau Claire, for the past two and one half years, died suddenly following a heart attack.

Sister Calista came from Decatur, Illinois, in 1938, after serving 16 years as Sister superior of St. Mary's Hospital. Her sudden death came as a great shock to the doctors, nurses, Sisters, and other hospital attachés who had been associated with her. They were warm in their praises of her high attributes of character, her great charity, her motherly heart, her ability and energy, all of which contributed much to the success of her administration of affairs of the hospital.

Elect New Staff Head. At its annual meeting recently, the staff of St. Joseph's Hospital, Rice Lake, elected Dr. R. W. Adams president, to succeed Dr. A. S. White, who held the office for many years. Dr. White retired because of poor health and will spend several months in the south.

St. Joseph's Hospital will celebrate the 25th year of its existence this year.

Hospital Sister Dies. Sister Petronia, 40, head of the credit department of Sacred Heart Hospital in Eau Claire, former superior of St. Elizabeth's Hospital in Belleville, Ill., died recently.

Hospital Head Transferred. Sister M. Seraphia, for many years superintendent of St. Agnes Hospital in Fond du Lac, has gone to Kansas where she will take charge of the Thomas county hospital, now being erected in Colby. Sister Seraphia will be succeeded at Fond du Lac by Sister M. Sebastian.

The growth of St. Agnes Hospital paralleled the many years of service given by Sister Seraphia. She was its superintendent when in 1921 the silver jubilee of its opening was observed. In 1925 during her superintendency a third building was added to the hospital, increasing its capacity to 260 beds. In 1931 another new wing was added.

Discoverer of Insulin Dies

Dr. Sir Frederick Grant Banting, codiscoverer of insulin, was killed in an airplane crash in Newfoundland, February 21. He was on his way to England on an important mission connected with the practical research work in medical problems associated with "the speed, height, and low temperatures involved in the operation of modern aircraft."